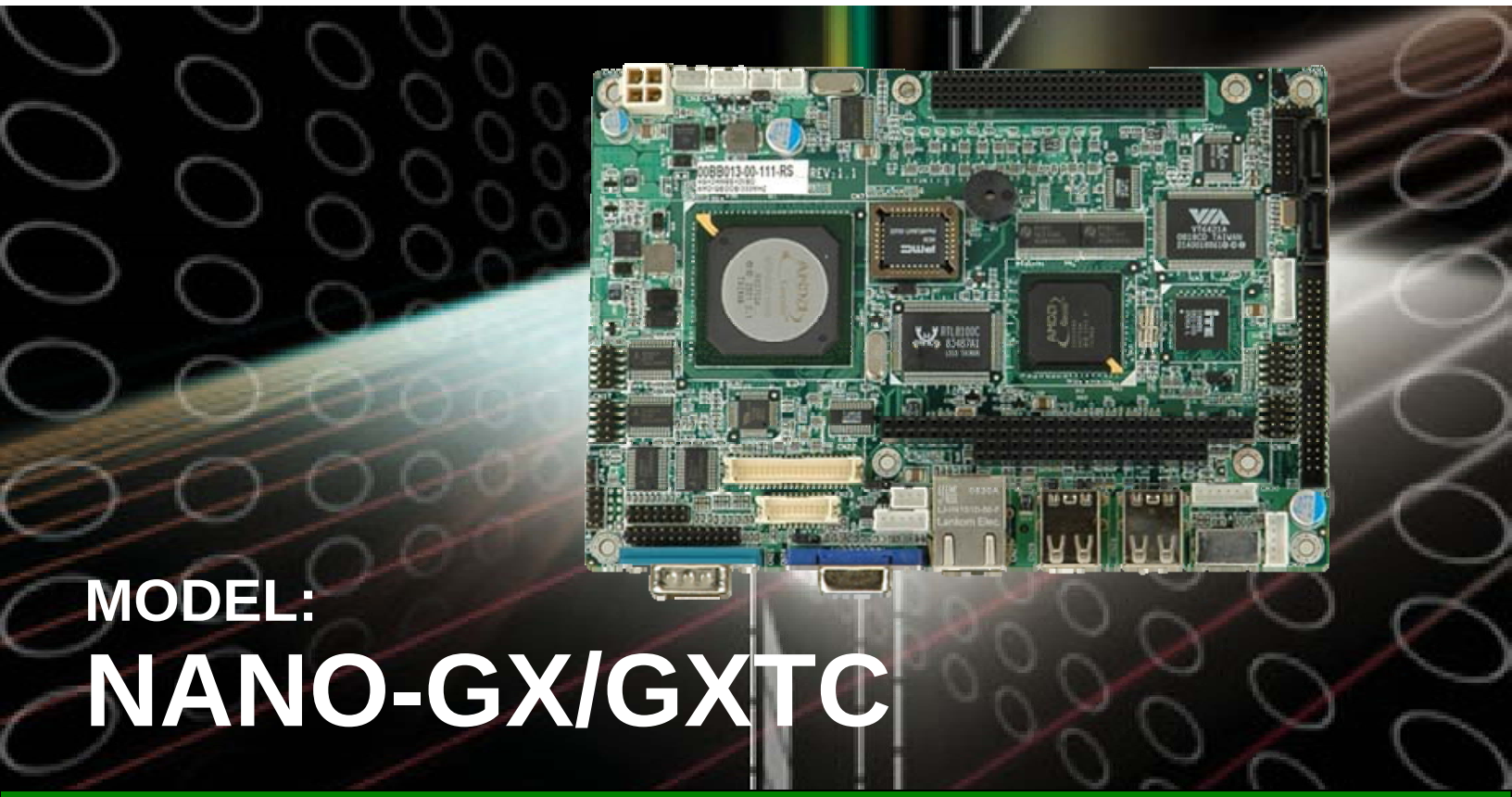
IEI Technology Corp.



MODEL:

NANO-GX/GXTC

EPIC SBC with AMD® Geode™ GX466 333 MHz CPU, CRT/LVDS, LAN, SATA, USB 2.0, RS-232/422/485, Audio, SATA, CF Card Type 2, RoHS Compliant

User Manual

Rev. 1.00 – 23 June, 2009

RoHS Lead Free

Revision

Date	Version	Changes
23 June, 2009	1.10	Modified SATA IC and BIOS
December 2006	1.00	Initial release

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Chapter

1

Introduction

1.1 NANO-GX CPU Board Overview

The EPIC form factor NANO-GX AMD Geode™ GX 466 is a highly integrated embedded computer specifically optimized for multi-media applications requiring minimum installation space. The NANO-GX is particularly suitable for low power and fan-less applications. The NANO-GX supports a full range of functionality for an AT/ATX-compatible industrial computer in a space-saving 3.5" profile. The NANO-GX is equipped with an onboard low-power consumption and high performance AMD Geode™ GX 466 processor. It also contains a DDR SODIMM socket that supports up to 512MB memory in size.

1.1.1 NANO-GX Models

The NANO-GX series has two models:

- NANO-GX-466-R11
- NANO-GXTC-466-R11

The specifications for the two models are show in **Table 1-1**.

	NANO-GX-466-R11	NANO-GXTC-466-R11
Audio	YES	YES
Dual LAN	YES	YES
CRT	YES	YES
TTL LCD	YES	NO
LVDS	YES	NO
SATA	YES	NO
USB 2.0	YES	YES

Table 1-1: NANO-GX Model Specifications

1.1.2 NANO-GX CPU Board Applications

The NANO-GX motherboard has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

1.1.3 NANO-GX CPU Board Benefits

Some of the NANO-GX motherboard benefits include,

- operating reliably in harsh industrial environments with ambient temperatures as high as 60°C
- rebooting automatically if the BIOS watchdog timer detects that the system is no longer operating

1.1.4 NANO-GX CPU Board Features

Some of the NANO-GX motherboard features are listed below:

- EPIC form factor
- Complies with RoHS
- Embedded AMD Geode™ GX 466 CPU
- Supports a maximum front side bus (FSB) speed up to 333MHz
- PC/104-Plus expansion slot
- Supports up to 512MB of 266MHz SODIMM DDR memory
- Comes with one high performance Ethernet (10/100M) controller
- Two SATA channels with transfer rates up to 150MB/s onboard
- Supports four USB 2.0 devices
- Integrated audio

1.2 NANO-GX Overview

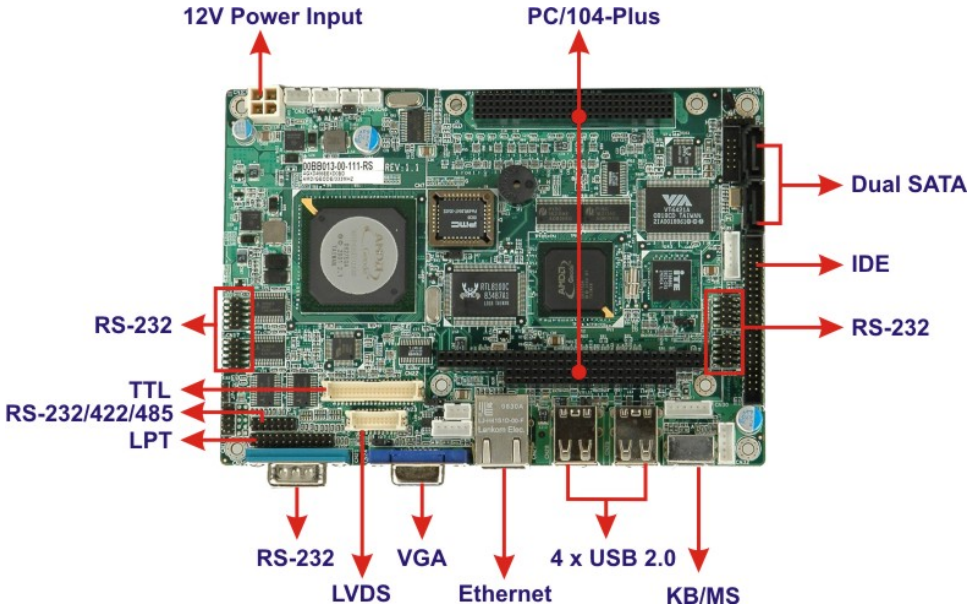


Figure 1-1: NANO-GX CPU Board Overview (Front Side)

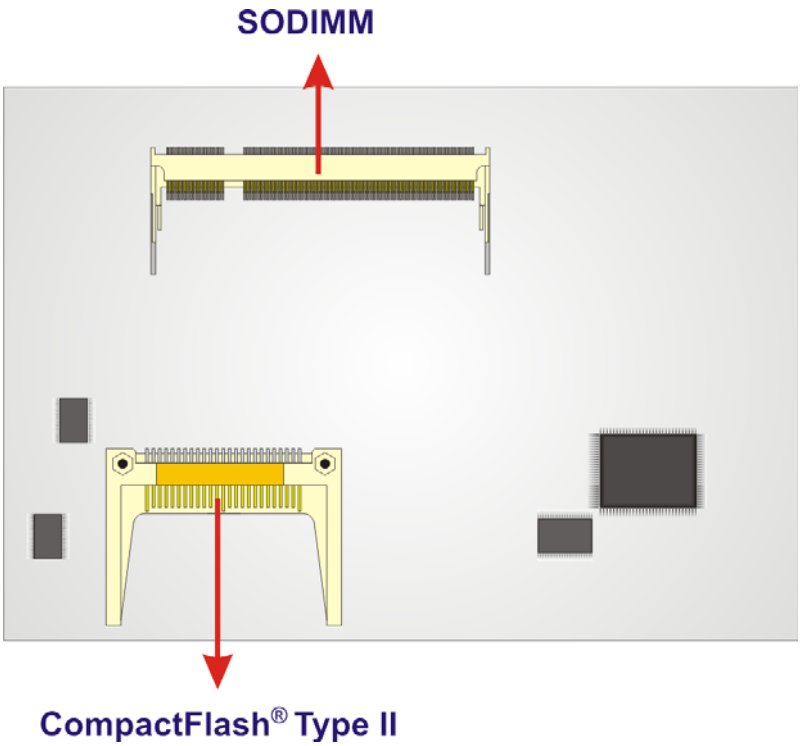


Figure 1-2: NANO-GX CPU Board Overview (Solder Side)

1.2.1 NANO-GX CPU Board Connectors

The NANO-GX has the following connectors onboard:

- 1 x ATX power button connector
- 1x ATX Suspend power input connector
- 1x Audio CD-IN connector
- 1x Audio connector
- 1x Backlight inverter connector
- 1x Digital I/O Connector
- 1x Fan connector
- 1x IrDA Infrared interface connector
- 1x Keyboard / mouse connector
- 1x Parallel port connector
- 1x Power and HDD LED connector
- 1x Power input connector
- 1x PC/104-Plus slot

- 1x PC/104-Plus power input connector
- 1x Reset button
- 2 x Serial ATA connectors
- 4 x Serial port RS2-232 connectors
- 1 x Serial and RS-422/485 port connector
- 1x TFT LVDS LCD Panel Connector
- 1x TFT TTL LCD (Hirose DF13-40DP-1.25V) connector

The NANO-GX has the following external peripheral interface connectors:

- 1 x Ethernet connector
- 1 x PS/2 Keyboard/mouse connector
- 1 x RS-232 connector
- 4 x USB 2.0 port connectors
- 1 x VGA connector

The NANO-GX has the following onboard jumpers:

- AT/ATX power mode select
- COM1/2 port RI and voltage selection (optional)
- CRT/LCD mode select
- LCD panel (LVDS/TTL) voltage select
- LCD panel shift clock setting
- PC/104-Plus VIO voltage select jumper & SERIRQ select
- RS-422/RS-485 select

The location of these connectors on the motherboard can be seen in **Figure 3-1**. These connectors are fully described in **Chapter 3.2**.

1.3 Dimensions

The dimensions of the board are listed below:

- **Length**: 165mm
- **Width**: 115mm

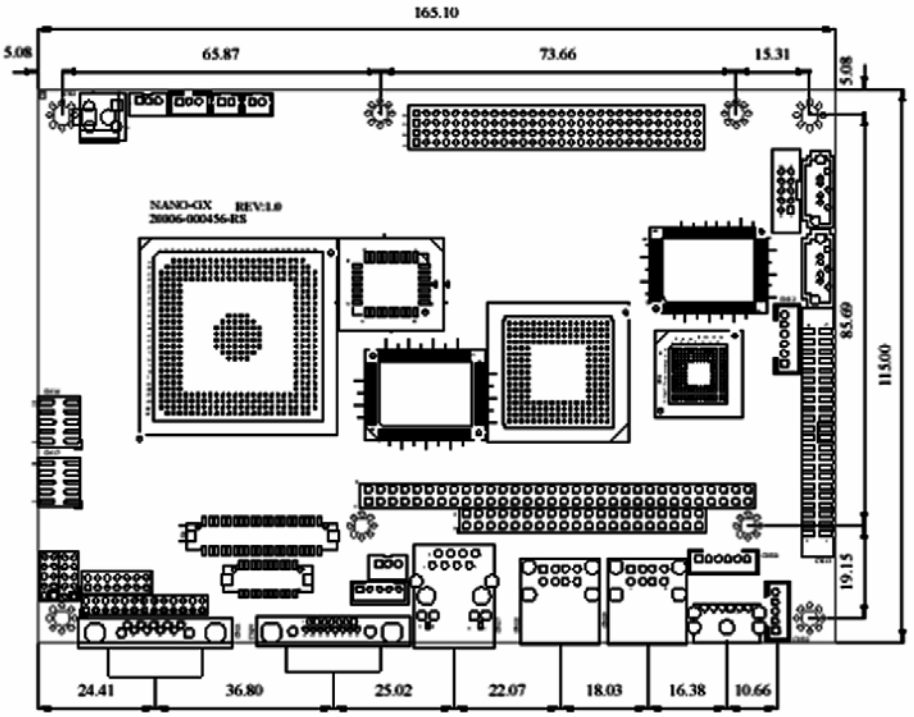


Figure 1-3: NANO-GX Dimensions (mm)

1.3.1 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 1-4**.

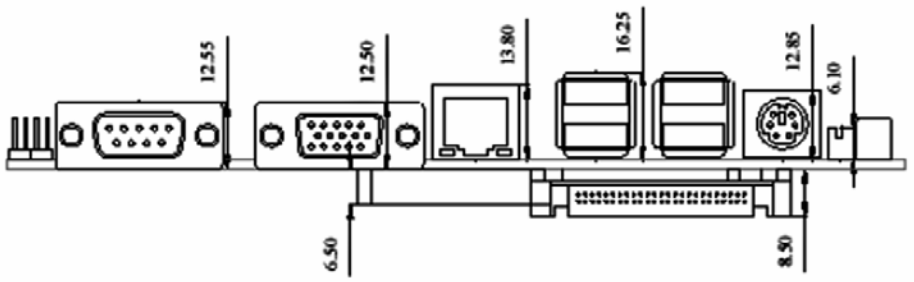


Figure 1-4: External Interface Panel Dimensions (mm)

1.4 Data Flow

The NANO-GX motherboard comes with an AMD Geode™ GX 466 and an AMD Geode™ CS5536 linked together by the GeodeLink™ Interface Unit. **Figure 1-5** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

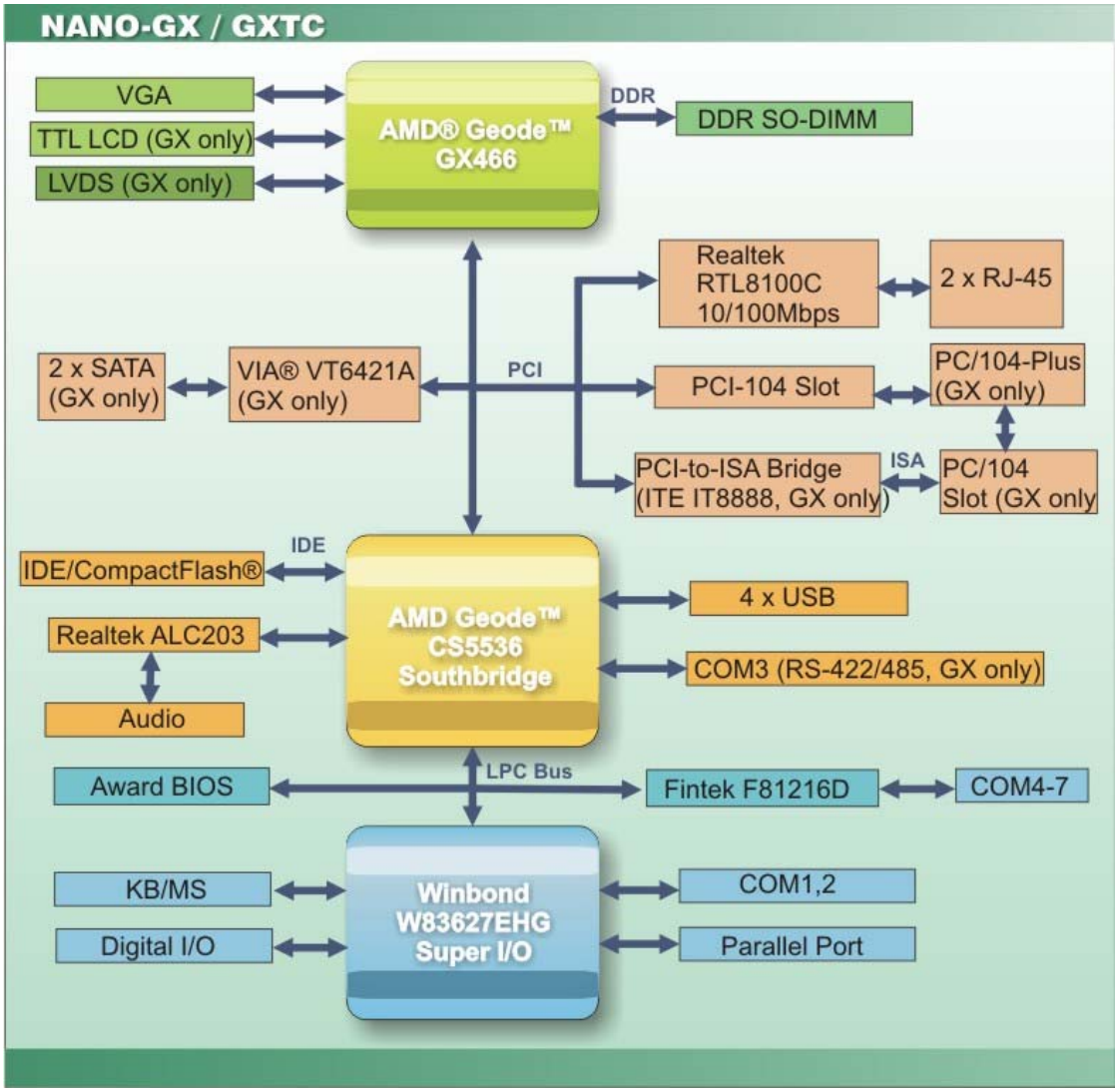


Figure 1-5: Data Flow Block Diagram

1.4.1 Technical Specifications:

NANO-GX motherboard technical specifications are listed below.

Specification/Model	NANO-GX / GXTC
Form Factor	EPIC
CPU Supported	AMD® Geode™ GX466 333MHz processor
Integrated Graphics	AMD® Geode™ GX466
Memory	One 200-pin 266/200MHz DDR SO-DIMM slot (up to 512 MB)
Southbridge Chipset	AMD Geode™ CS5536 Chipset
BIOS	Award BIOS
Compatible OS	Microsoft Windows XP
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	RTL8100C
RAID Controller	VIA VT6421A with RAID 0,1 function support (NANO-GX only)
Super I/O Controller	Winbond W83627EHG
Serial Port Controller	Fintek F81216
Audio	Realtek ALC203 with AC'97 codec
Real Time Clock	256 bytes of battery-backed RAM, 32.768 KHz crystal, 3 V battery
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Infrared	One Infrared interface by pin header
Expansion	
PCI	One PC/104-Plus via ITE IT8888G PCI-to-ISA bridge (NANO-GX) One PC-104 (NANO-GXTC)
I/O Interface Connectors	

Specification/Model	NANO-GX / GXTC
Display	One VGA One LVDS (internal, NANO-GX only) One TTL LCD (internal, NANO-GX only)
Ethernet	One RJ-45
Keyboard/Mouse	One PS/2 KB/MS
LPT	One IEEE 1284 parallel (supports normal, EPP and ECP modes)
Serial	Six RS-232 (one external, five internal) One RS-232/422/485 (internal, NANO-GX only)
USB 2.0/1.1	Four USB 2.0 ports
Storage	
SATA	Two SATA1 connectors (NANO-GX only)
IDE	One IDE
CF	One CF card slot
Environmental and Power Specifications	
Power Supply	12V only, AT/ATX support
Power Consumption	12 V @ 0.83A (AMD® Geode™ GX466, 512 MB DDR 400 MHz)
Operating temperature	0ºC ~ 60ºC (32ºF~140ºF)
Humidity	0% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	115 mm x 165 mm
Weight GW/NW	950g/350g

Table 1-2: NANO-GX Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the NANO-GX is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-GX was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

2.3.1 Package Contents

The NANO-GX is shipped with the following components:

Quantity	Item	Image
1	NANO-GX / GXTC	
1	12V Power Cable	
1	Audio Cable	
1	ATA33 Flat Cable	

1	Dual RS-232 Cable	
1	Mini jumper pack	
1	KB/MS Y cable	
2	SATA cable	
1	SATA power cable	
1	Quick Installation Guide	
1	Utility CD	

Table 2-1: Package List Contents

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

Figure 3-1 and **Figure 3-2** show all the onboard peripheral connectors, rear panel peripheral connectors and onboard jumpers. **Section 3.1.1** lists all the peripheral interface connectors.

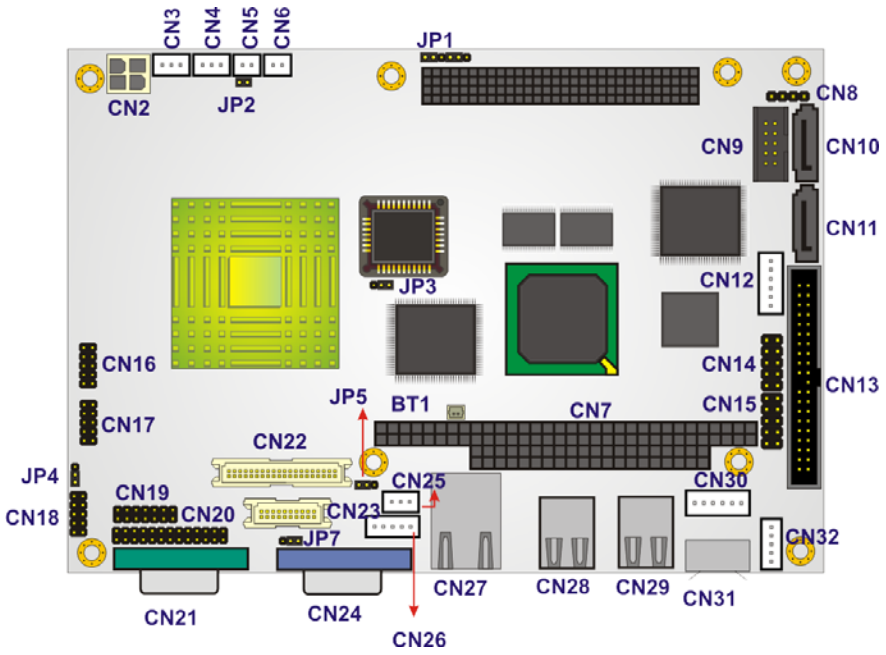


Figure 3-1: Connector and Jumper Locations

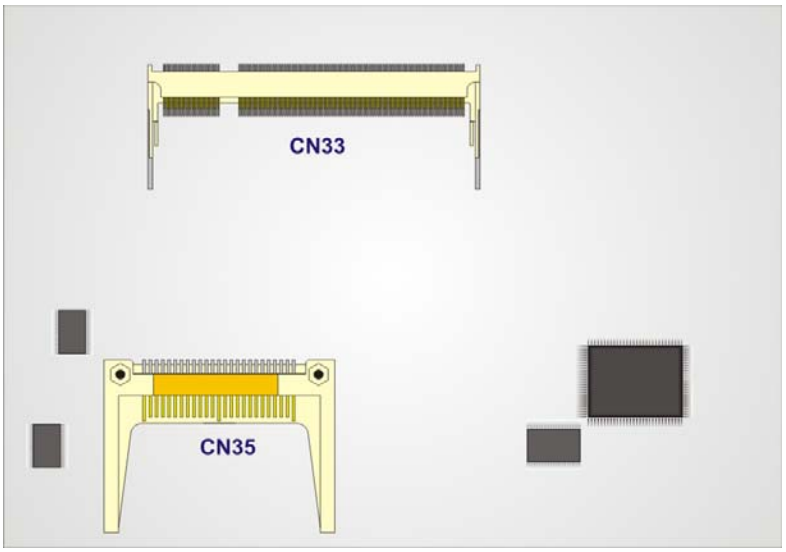


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.1 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the NANO-GX. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
12V Power input connector	4-pin wafer	CN2
ATX power button connector	2-pin wafer	CN5
ATX Suspend power input connector	3-pin wafer	CN3
Audio CD-IN connector	4-pin header	CN8
Audio connector	10-pin box header	CN9
Backlight inverter connector	5-pin wafer	CN26
Digital I/O connector	10-pin header	CN18
CF card slot	50-pin header (2x25)	CN35
Fan connector	3-pin wafer	CN4
IrDA Infrared interface connector	5-pin wafer	CN32
Keyboard / mouse connector	6-pin wafer	CN30
Parallel port connector	26-pin header	CN20
Power and HDD LED connector	6-pin wafer	CN12
PC/104-Plus slot	140-pin PC/104+ 120-pin PCI-104	CN7
PC/104-Plus power input connector	3-pin wafer	CN25
Reset button	2-pin wafer	CN6
Serial ATA connectors	7-pin SATA connector	CN10, CN11
Serial port RS2-232 connectors	10-pin header	CN14 - 17
Serial and RS-422/485 port connector	14-pin header	CN19
TFT LVDS LCD panel connector	20-pin crimp	CN23
TFT TTL LCD (Hirose DF13-40DP-1.25V) connector	40-pin crimp	CN22

Table 3-1: Peripheral Interface Connectors

External Interface Panel Connectors

Table 3-2 lists the rear panel connectors on the NANO-GX. Detailed descriptions of these connectors can be found in **Section 3.1**.

Connector	Type	Label
Ethernet connector	RJ-45	CN27
PS/2 Keyboard/mouse connector	Mini-DIN 6 PS/2	CN31
RS-232 serial port connector	9-pin male	CN21
USB 2.0 ports	Combo USB port	CN28, CN29
VGA port connector	15-pin female	CN24

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the NANO-GX.

3.2.1 12V Power Input Connector

CN Label: **CN2**

CN Type: 4-pin wafer (2x2)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-3**

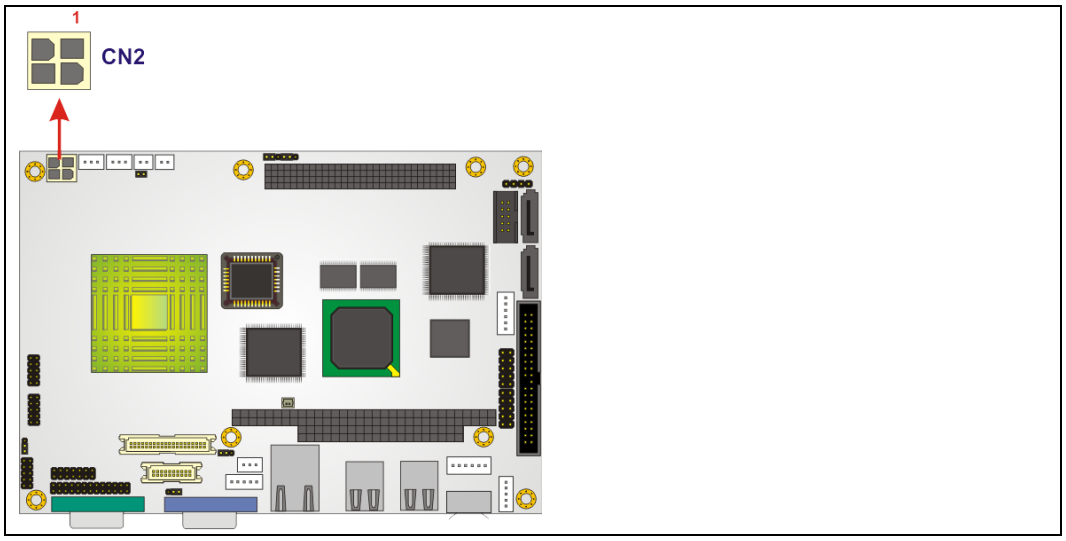


Figure 3-3: 12V Power Input Connector Pinouts

PIN NO.	DESCRIPTION
1	GROUND
2	GROUND
3	Power IN(+12V)
4	Power IN(+12V)

Table 3-3: 12V Power Input Connector Pinouts

3.2.2 ATX Power Button Connector

CN Label: **CN5**

CN Type: 2-pin wafer

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-4**

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

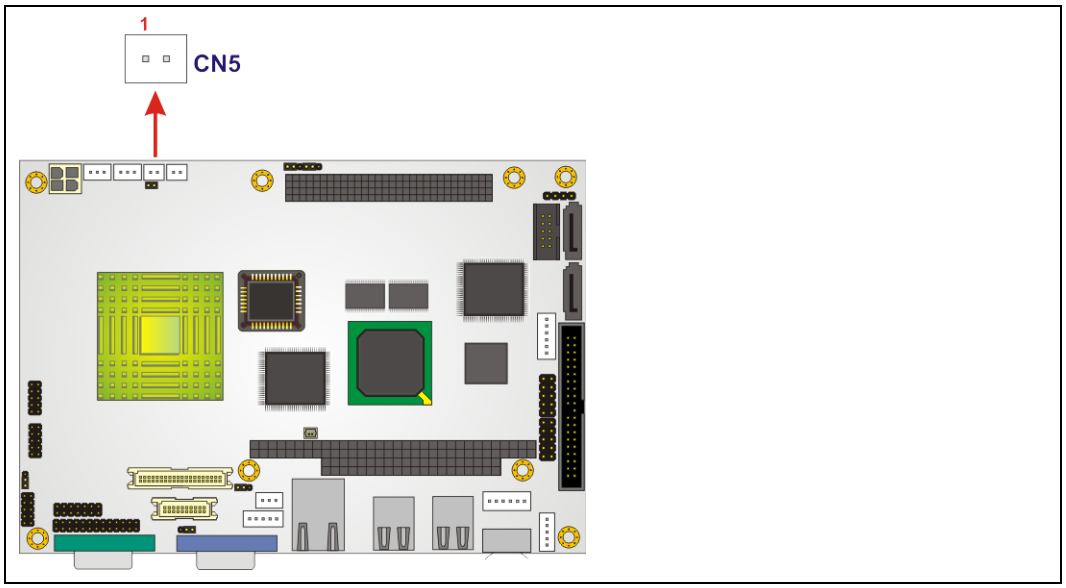


Figure 3-4: ATX Power Button Connector Location

PIN NO.	DESCRIPTION
1	ATX Power button +
2	ATX Power button -

Table 3-4: AT Power Connector Pinouts

3.2.3 ATX Suspend Power Input Connector

CN Label: **CN3**

CN Type: 3-pin wafer

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-5**

The suspend power input connector connects to an ATX power supply.

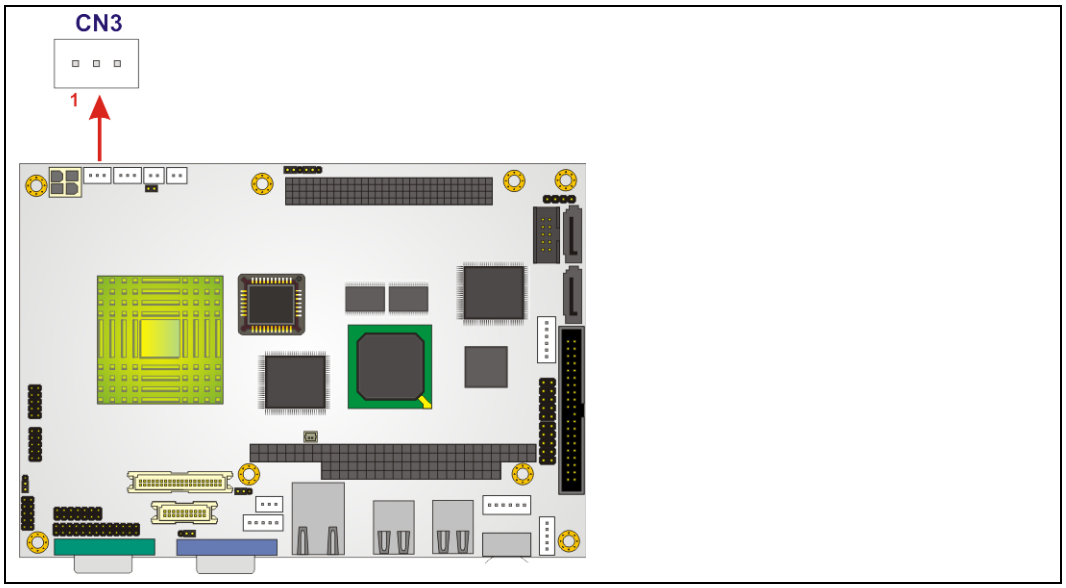


Figure 3-5: ATX Suspend Power Input Connector Location

PIN NO.	DESCRIPTION
1	5VSB
2	NC
3	PS_ON

Table 3-5: ATX Suspend Power Input Connector Pinouts

3.2.4 Audio Connector (10-pin)

CN Label: **CN9**

CN Type: 10-pin box header

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-6**

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

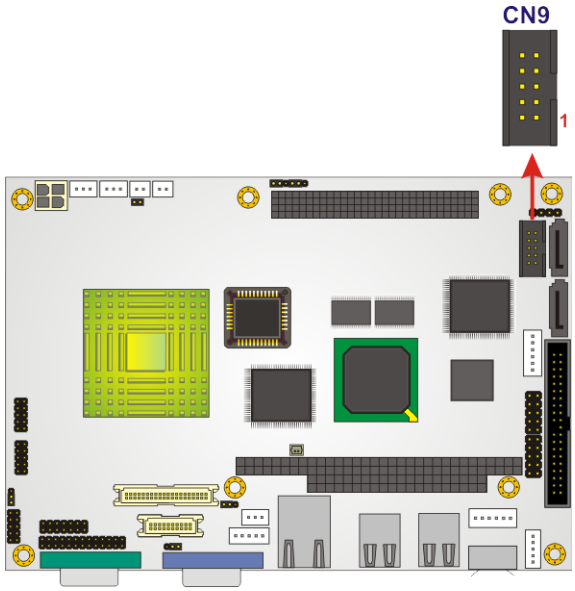


Figure 3-6: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUT_R	2	LINE_IN_R
3	GROUND	4	GROUND
5	LINE_OUT_L	6	LINE_IN_L
7	GROUND	8	GROUND
9	MIC1	10	NC

Table 3-6: Audio Connector Pinouts (10-pin)

3.2.5 Audio CD-In Connector (4-pin)

CN Label: **CN8**

CN Type: 4-pin header

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-7**

The 4-pin audio CD-in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

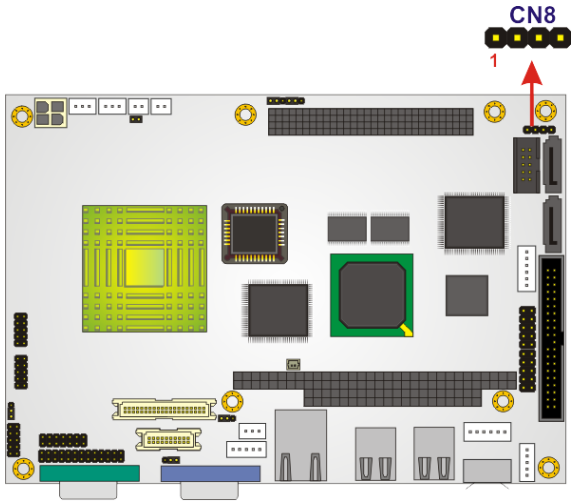


Figure 3-7: Audio CD-In Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION
1	CD Signal (Left)
2	Ground
3	Ground
4	CD Signal (Right)

Table 3-7: Audio CD In Connector Pinouts

3.2.6 Backlight Inverter Connector

CN Label: **CN26**

CN Type: 5-pin wafer

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The backlight inverter connector provides the backlight on the LCD display connected to the NANO-GX with +12V of power.

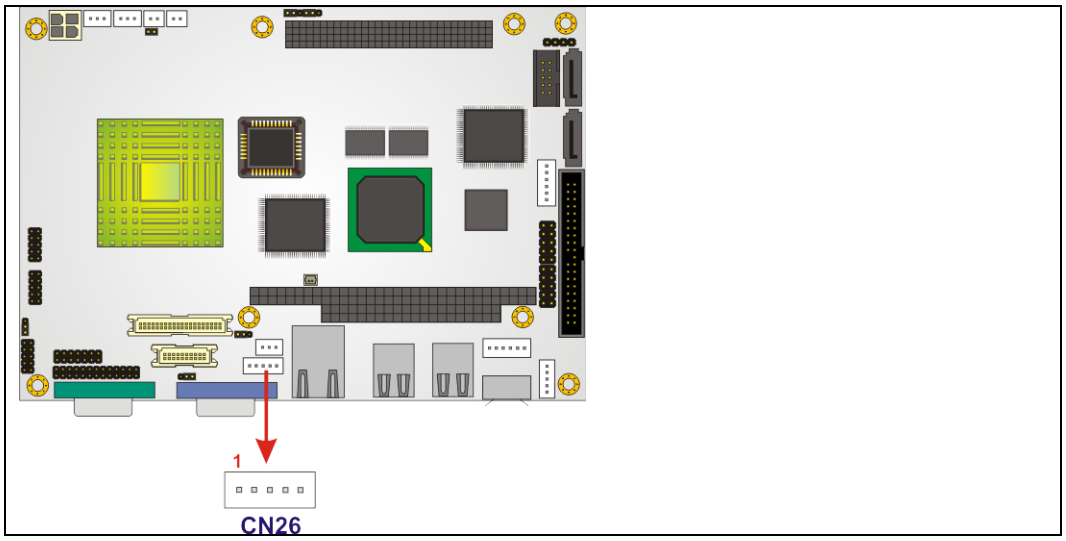


Figure 3-8: Backlight Inverter Connector Pinout Location

PIN NO.	DESCRIPTION
1	BL_ADJ (DEFAULT: GND)
2	GND
3	VCC12
4	GND
5	VDD_EN

Table 3-8: Backlight Inverter Connector Pinouts

3.2.7 CompactFlash® Socket

CN Label: **CN35** (solder side)

CN Type: 50-pin header (2x25)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the NANO-GX.

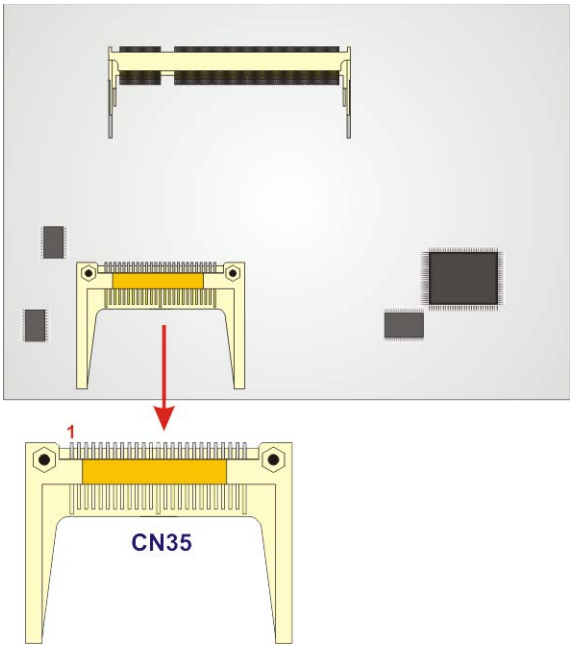


Figure 3-9: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	GND
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	GND	33	N/C
9	GROUND	34	IOR#
10	GND	35	IOW#
11	GND	36	VCC5
12	GND	37	IRQ15
13	VCC5	38	VCC5
14	GND	39	CSEL
15	GND	40	N/C
16	GND	41	HDD_RESET
17	GND	42	RDY

18	SA2	43	DRQ
19	SA1	44	DACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	CABLEID
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	GND	50	GROUND

Table 3-9: CF Card Socket Pinouts

3.2.8 Digital Input/Output (DIO) Connector

CN Label: **CN18**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-10**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

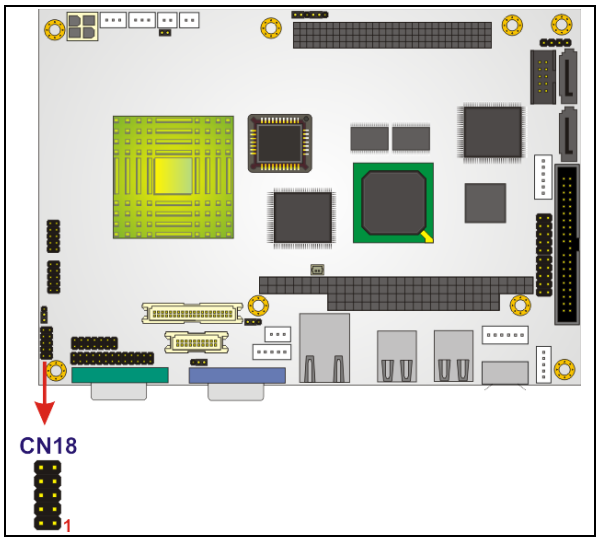


Figure 3-10: DIO Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC5
3	Output 0	4	Output 1
5	Output 2	6	Output 3
7	Input 0	8	Input 1
9	Input 2	10	Input 3

Table 3-10: DIO Connector Pinouts

3.2.9 Fan Connector (+5V)

CN Label: **CN4**

CN Type: 3-pin wafer

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-11**

The cooling fan connector provides a 5V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

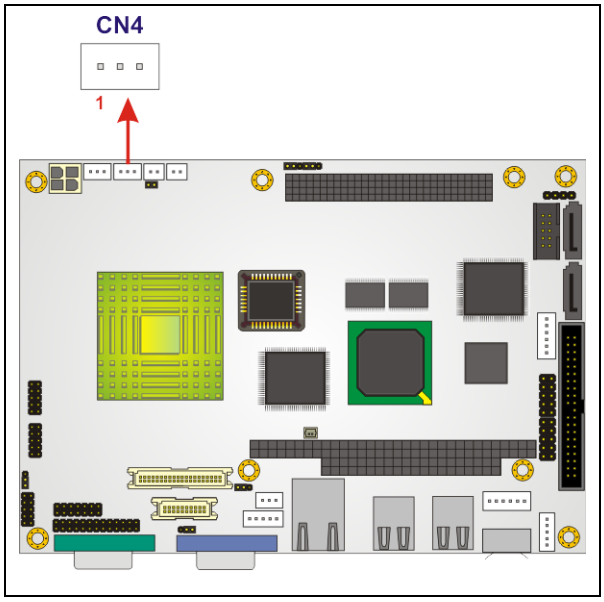


Figure 3-11: +5V Fan Connector Location

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+5V
3	GND

Table 3-11: +5V Fan Connector Pinouts

3.2.10 IDE Connector (44-pin)

CN Label: **CN13**

CN Type: 44-pin box header (2x22)

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-12**

One 44-pin IDE device connector on the NANO-GX supports connectivity to two hard disk drives.

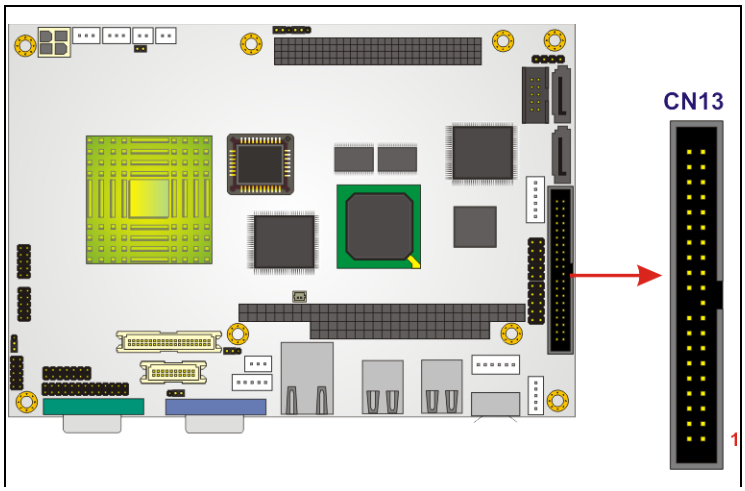


Figure 3-12: IDE Device Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11

11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-12: IDE Connector Pinouts

3.2.11 Infrared Interface Connector (5-pin)

CN Label: **CN32**

CN Type: 5-pin wafer

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-13**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

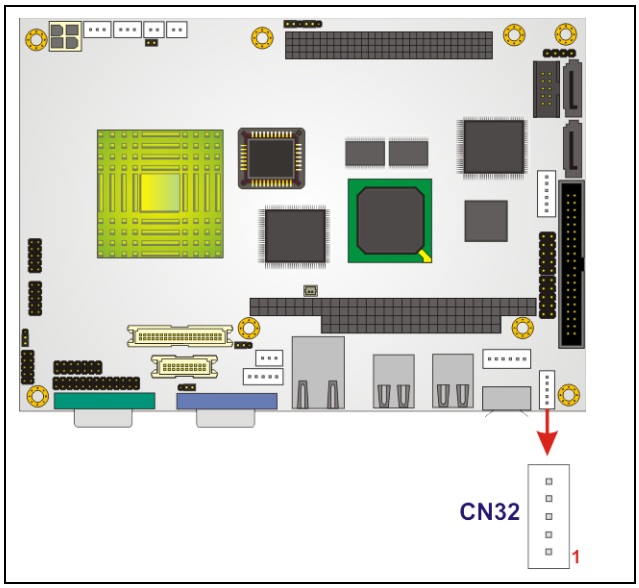


Figure 3-13: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC5
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-13: Infrared Connector Pinouts

3.2.12 Keyboard/Mouse Connector

CN Label: **CN30**

CN Type: 6-pin wafer

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-14**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.

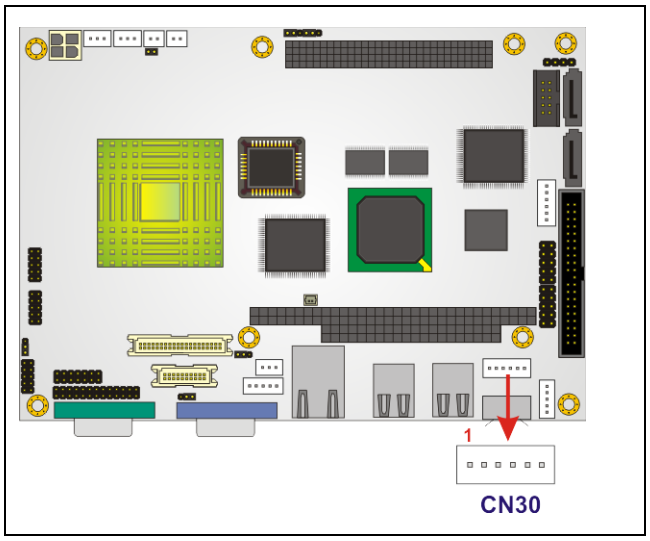


Figure 3-14: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	VCC5
2	Mouse DATA
3	Mouse Clock
4	Keyboard DATA
5	Keyboard Clock
6	GROUND

Table 3-14: Keyboard/Mouse Connector Pinouts

3.2.13 Parallel Port Connector

CN Label: **CN20**

CN Type: 26-pin header

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-15**

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

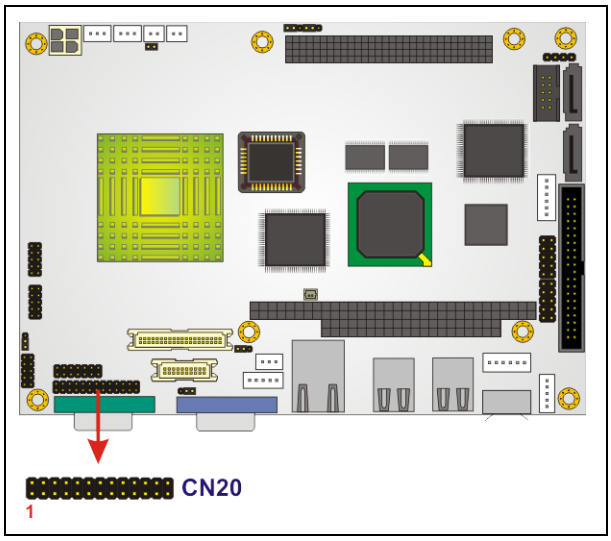


Figure 3-15: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PRN_STB#	2	PRN_AFD#
3	PRN_PD0	4	PRN_ERR#
5	PRN_PD1	6	PRN_INIT#
7	PRN_PD2	8	PRN_SLIN#
9	PRN_PD3	10	GND
11	PRN_PD4	12	GND
13	PRN_PD5	14	GND
15	PRN_PD6	16	GND
17	PRN_PD7	18	GND
19	PRN_ACK#	20	GND
21	PRN_BUSY	22	GND
23	PRN_PE	24	GND
25	PRN_SLCT	26	NC

Table 3-15: Parallel Port Connector Pinouts

3.2.14 PC/104-Plus Slot

The NANO-GX features a PC/104-Plus slot for expansion. PC/104-Plus consists of a PC/104 slot and a PCI-104 slot.

The PC/104 slot enables a PC/104 compatible expansion module to be connected to the board. The PCI-104 slot enables a PCI-104 compatible expansion module to be connected to the board.

CN Label:	**CN7**
CN Type:	104-pin PC/104 slot, 120-pin PCI-104 slot
CN Location:	See **Figure 3-16**
CN Pinouts:	See **Table 3-16** for PC/104 slot pinouts See **Table 3-17** for PCI-104 slot pinouts

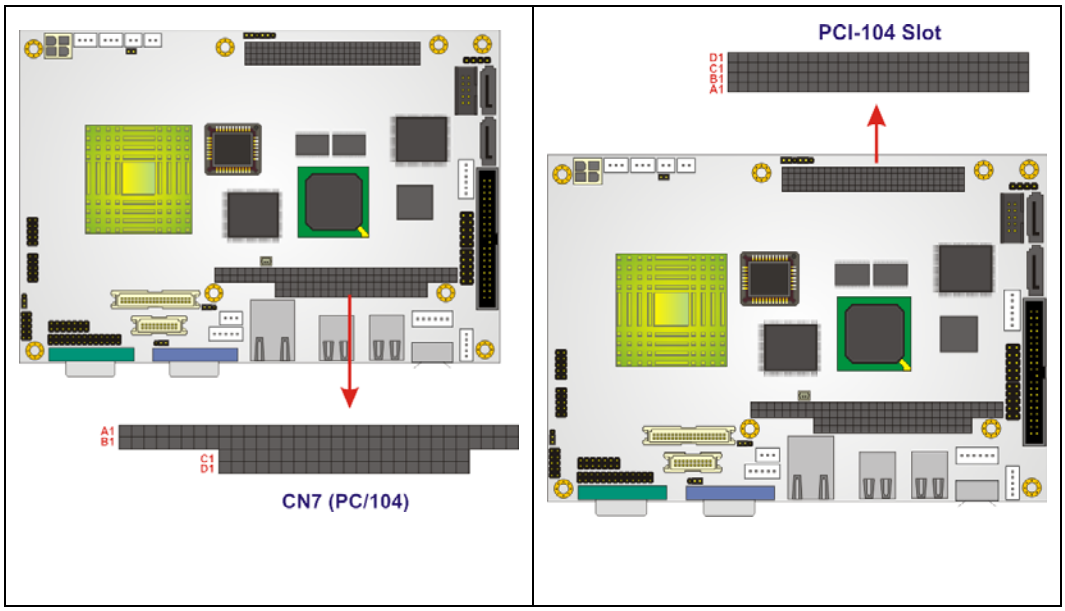


Figure 3-16: PCI/104-Plus Slot Location

Pin No.	Column A	Column B	Column C	Column D
1	IOCHK-	GROUND	GROUND	GROUND
2	SD7	RSTDRV	SBHE-	MCS16-
3	SD6	+5V	SA23	IOCS16-
4	SD5	IRQ9	SA22	IRQ10
5	SD4	-5V	SA21	IRQ11
6	SD3	DREQ2	SA20	IRQ12
7	SD2	-12V	SA19	IRQ15
8	SD1	ZWS-	SA18	IRQ14
9	SD0	+12V	SA17	DACK0-

10	IOCHRDY	GROUND	MEMR-	DREQ0
11	AEN	SMEMW-	MEMW-	DACK5-
12	SA19	SMEMR-	SD8	DRREQ5
13	SA18	IOW-	SD9	DACK6-
14	SA17	IOR-	SD10	DREQ6
15	SA16	DACK3-	SD11	DACK7-
16	SA15	DREQ3	SD12	DREQ7
17	SA14	DACK1-	SD13	+5V
18	SA13	DREQ1	SD14	MASTER-
19	SA12	REFRESH-	SD15	GROUND
20	SA11	ISACLK	NC	GROUND
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2-		
27	SA4	TC		
28	SA3	BALE		
29	SA2	+5V		
30	SA1	ISA_OSC		
31	SA0	GROUND		
32	GROUND	GROUND		

Table 3-16: PC/104 Slot Connector Pinouts

Pin	Description	Pin	Description	Pin	Description	Pin	Description
A1	GND	B1	SERIRQ#	C1	VCC5	D1	AD0
A2	VI0	B2	AD2	C2	AD1	D2	VCC5
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	BE0#	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	VIO	C6	AD10	D6	GND
A7	AD14	B7	AD13	C7	GND	D7	AD12

A8	VCC3	B8	BE1#	C8	AD15	D8	VCC3
A9	PULL 3V	B9	GND	C9	PULL 3V	D9	PAR
A10	GND	B10	PULL 3V	C10	VCC3	D10	PULL 3V
A11	STOP#	B11	VCC3	C11	PULL 3V	D11	GND
A12	VCC3	B12	TRDY#	C12	GND	D12	DEVSEL#
A13	FRAME#	B13	GND	C13	IRDY#	D13	VCC3
A14	GND	B14	AD16	C14	VCC3	D14	BE2#
A15	AD18	B15	VCC3	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	VCC3	B17	AD23	C17	AD22	D17	VCC3
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	BE3#	C19	VIO	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	VCC5	C21	AD28	D21	AD27
A22	VCC5	B22	AD30	C22	GND	D22	AD31
A23	REQ0	B23	GND	C23	REQ1	D23	VIO
A24	GND	B24	REQ2	C24	VCC5	D24	GNT0
A25	GNT1	B25	VIO	C25	GNT2	D25	GND
A26	VCC5	B26	CLOCK0	C26	GND	D26	CLOCK1
A27	CLOCK2	B27	VCC5	C27	CLOCK3	D27	GND
A28	GND	B28	INTD#	C28	VCC5	D28	RESET
A29	+12V	B29	INTA#	C29	INTB#	D29	INTC#
A30	-12V	B30	NC	C30	NC	D30	GND

Table 3-17: PCI-104 Slot Connector Pinouts

3.2.15 PC/104 Power Input Connector

CN Label: **CN25**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-18**

The PC/104 power input connector provides power to the PC/104 expansion module installed on the PC/104 slot.

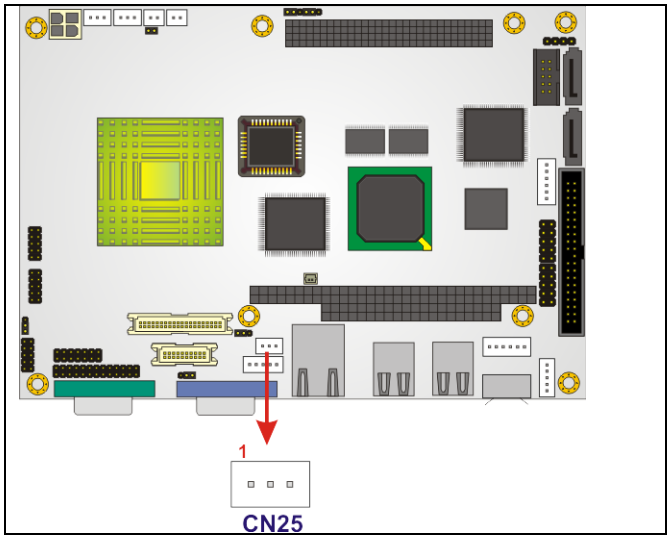


Figure 3-17: PC/104 Power Input Connector Pinouts

PIN NO.	DESCRIPTION
1	-VCC5
2	GROUND
3	-VCC12

Table 3-18: PC/104 Power Input Connector Pinouts

3.2.16 Power and HDD LED Connector

CN Label: **CN12**

CN Type: 6-pin wafer

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-15**

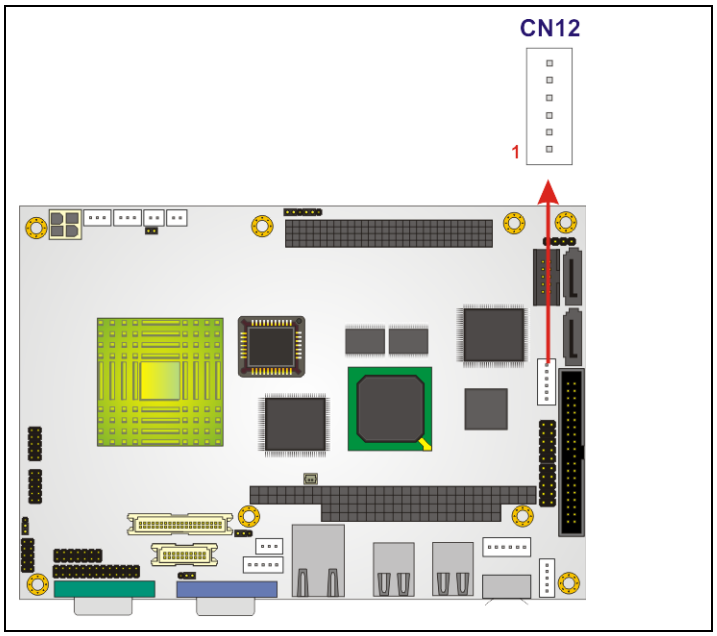


Figure 3-18: Power and HDD LED Connector Location

PIN NO.	DESCRIPTION
1	VCC5
2	GROUND
3	PWRLED+
4	PWRLED-
5	HDD LED+
6	HDD LED-

Table 3-19: Power and HDD LED Connector Pinouts

3.2.17 Reset Button Connector

CN Label: **CN6**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-20**

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

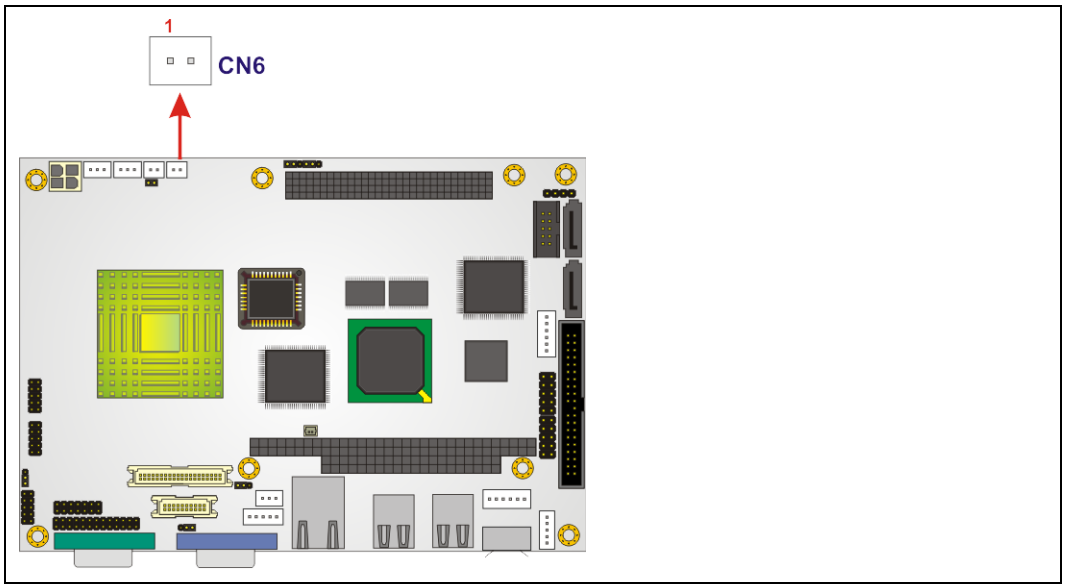


Figure 3-19: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset button +
2	Reset button -

Table 3-20: Reset Button Connector Pinouts

3.2.18 SATA Drive Connectors

CN Label: **CN10** and **CN11**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-21**

The two SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

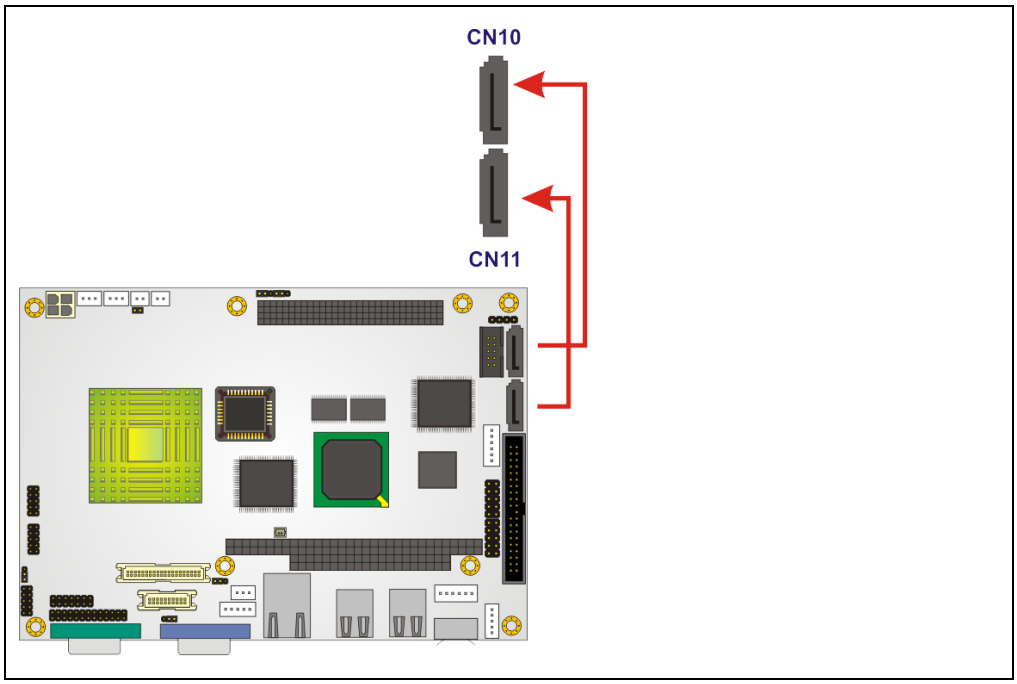


Figure 3-20: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-21: SATA Drive Connector Pinouts

3.2.19 Serial Port and RS-422 / RS-485 Connector

CN Label: **CN19**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-22**

The 14-pin serial port connector connects to the COM 2 serial communications channels. COM2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the JP4 jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

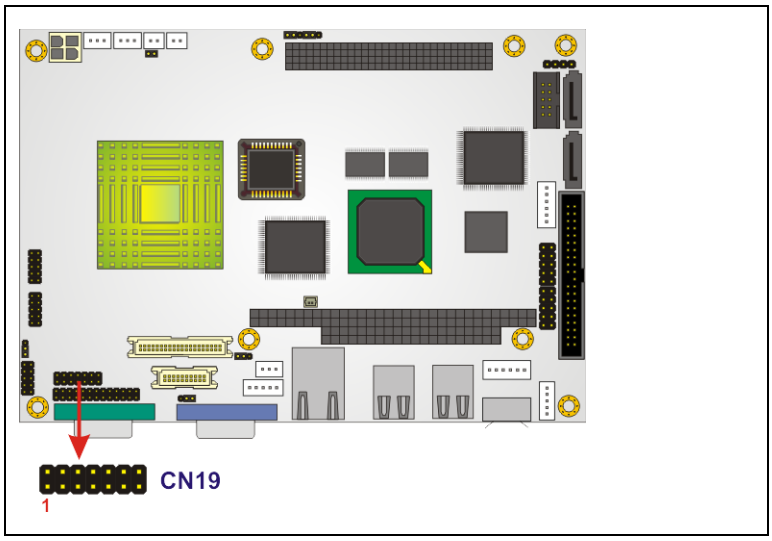


Figure 3-21: Serial and RS-422/485 Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GROUND	10	GROUND
11	TXD485+	12	TXD485#
13	RXD485+	14	RXD485#

Table 3-22: Serial and RS-422/RS-485 Port Connector Pinouts

3.2.20 Serial Port Connectors (COM2)

CN Label: **CN14, CN15, CN16, CN17**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-23**

The 10-pin serial port connectors provide RS-232 serial communications channels. The COM 2 serial port connectors can be connected to external RS-232 serial port devices.

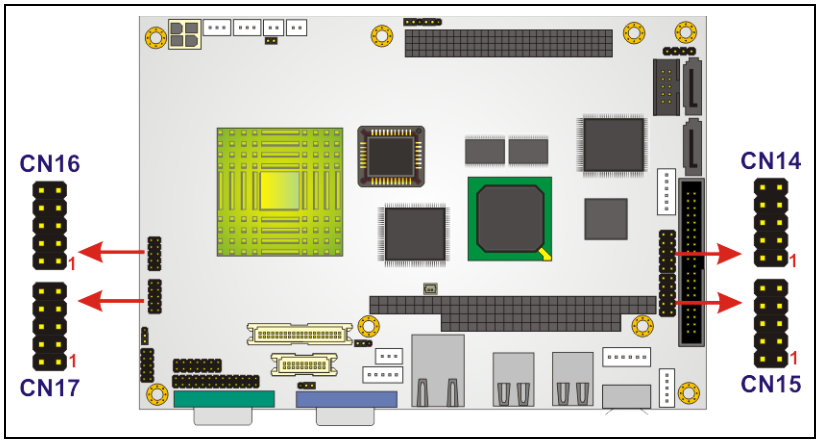


Figure 3-22: COM2 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)

Table 3-23: COM2 Connector Pinouts

3.2.21 TFT LVDS LCD Connector

CN Label: **CN23**

CN Type: 20-pin crimp connector (2x10)

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-24**

The 20-pin LVDS LCD connector can be connected to single channel 18-bit LVDS panel.

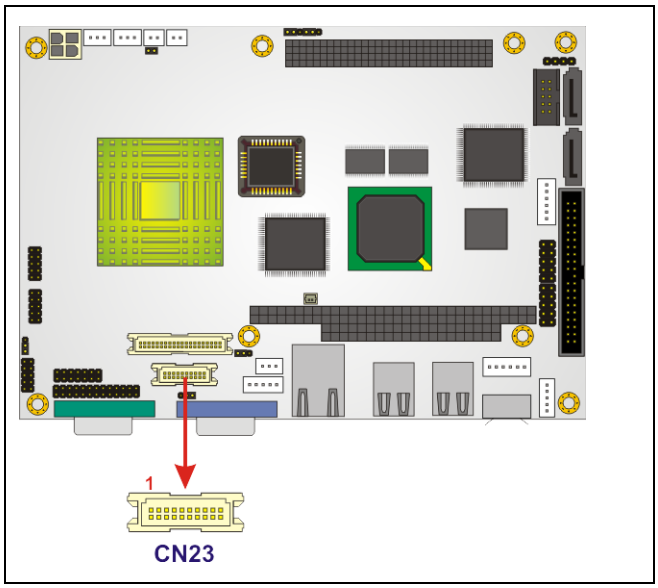


Figure 3-23: LVDS LCD Connector Pinout Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	GROUND	1	GROUND
4	LVD_Y0-	3	LVD_Y0+
6	LVD_Y1-	5	LVD_Y1+
8	LVD_Y2-	7	LVD_Y2
10	LVD_CLK-	9	LVD_CLK+
12	NC	11	NC
14	GROUND	13	GROUND
16	NC	15	NC
18	LVD_ VCC	17	LVD_ VCC
20	LVD_ VCC	19	LVD_ VCC

Table 3-24: LVDS LCD Port Connector Pinouts

3.2.22 TFT TTL LCD Connector

CN Label: **CN22**

CN Type: 40-pin crimp (2x20)

CN Location: See **Figure 3-24**

CN Pinouts: See **Table 3-25**

The 40-pin TFT TTL LCD connector can be connected to an LCD panel directly.

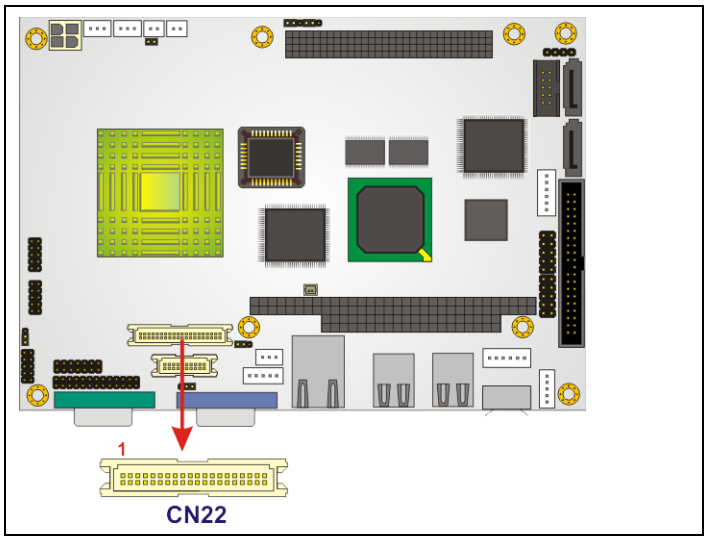


Figure 3-24: TFT TTL LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	LCD_VCC	1	LCD_VCC
4	GROUND	3	GROUND
6	LCD_VCC	5	LCD_VCC
8	GROUND	7	NC
10	B1	9	B0
12	B3	11	B2
14	B5	13	B4
16	B7	15	B6
18	G1	17	G0
20	G3	19	G2
22	G5	21	G4
24	G7	23	G6
26	R1	25	R0
28	R3	27	R2
30	R5	29	R4
32	R7	31	R6
34	GROUND	33	GROUND
36	FPVS	35	FPCLK

38	FPHS	37	FPDE
40	FPENVEE	39	NC

Table 3-25: TFT LCD Port Connector Pinouts

3.3 External Interface Connectors

Figure 3-25 shows the NANO-GX motherboard external interface connectors. The NANO-GX onboard external interface connectors are listed below and shown in **Figure 3-25**:

- 1 x Ethernet connector
- 1 x Keyboard/Mouse connector
- 1 x Serial communications port
- 2 x USB combo ports
- 1 x VGA port

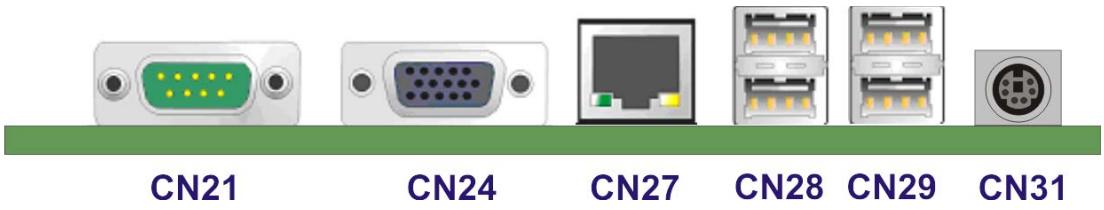


Figure 3-25: NANO-GX Onboard External Interface Connectors

3.3.1 Ethernet Connector

CN Label: **CN27**

CN Type: **RJ-45**

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-26**

A 10/100 Mbps connection can be made between the Ethernet connector and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX-	5	N/C
2	N/C	6	RX-
3	TX-	7	N/C
4	RX+	8	N/C

Table 3-26: Ethernet Connector Pinouts

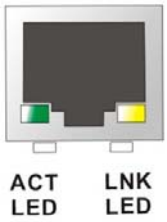


Figure 3-26: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked.

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 3-27: J7 Connector LEDs

3.3.2 PS/2 Keyboard/Mouse Connector

CN Label: **CN31**

CN Type: Mini-DIN 6 PS/2

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-28** and **Figure 3-27**

The NANO-GX has a mini-DIN 6 PS/2 connector on the mounting bracket for easy connection to a PS/2 keyboard or PS/2 mouse. The card comes with a cable to convert the mini-DIN 6 PS/2 into two mini-DIN 6 PS/2 connectors for keyboard and mouse connection.

Figure 3-27: Mini-DIN 6 PS/2 Connector

PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GND
4	VCC
5	KEYBOARD CLOCK
6	MOUSE CLOCK

Table 3-28: Mini-DIN 6 PS/2 Connector

3.3.3 RS-232 Serial Communications Connector

CN Label: **CN21**

CN Type: RS-232 serial connector

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-29** and **Figure 3-28**

The RS-232 serial connector provides serial connection in the RS-232 mode.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD1	2	DSR1
3	RX1	4	RTS1
5	TX1	6	CTS1
7	DTR1	8	RI1
9	GND		

Table 3-29: RS-232 Serial Communications Pinouts

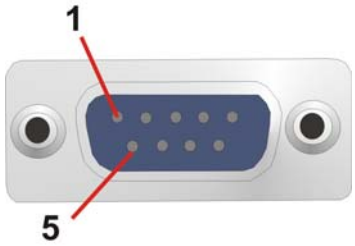


Figure 3-28: COM1 Pinout Locations

3.3.4 USB Combo Ports

CN Label: **CN28, CN29**

CN Type: USB Combo ports

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-30**

The USB combo port provides connectivity to additional USB devices through an adapter cable. Various adapters may come with USB ports on a slot bracket or ports that can be attached to D-SUB openings on a chassis. USB devices connect directly to the USB connectors on the rear panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	5V	2	GND
3	USBP2N	4	USBP3P
5	USBP2P	6	USBP3N
7	GND	8	5V

Table 3-30: J6 Connector Pinouts

3.3.5 VGA Connector

CN Label: **CN24**

CN Type: HD-D-sub 15 female connector

CN Location: See **Figure 3-25**

CN Pinouts: See **Figure 3-29** and **Table 3-31**

The standard 15-pin female VGA connector connects to a CRT or LCD monitor.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	DDCDAT
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	DDCCLK

Table 3-31: VGA1 Connector Pinouts

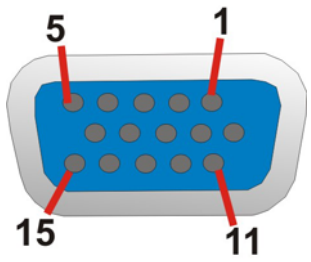


Figure 3-29: VGA1 Connector

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PM-LX2-800 may result in permanent damage to the PM-LX2-800 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PM-LX2-800. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PM-LX2-800 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PM-LX2-800, place it on an antic-static pad. This reduces the possibility of ESD damaging the PM-LX2-800.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the PM-LX2-800 is installed. All installation notices should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PM-LX2-800 and injury to the person installing the motherboard.

4.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PM-LX2-800, PM-LX2-800 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the PM-LX2-800 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PM-LX2-800 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the PM-LX2-800 off:
  - When working with the PM-LX2-800, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PM-LX2-800 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the PM-LX2-800 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The PM-LX2-800 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - IDE drives
  - RS-232 devices
  - RS-422/485 devices
  - Keyboard and mouse
  - LAN
  - LCD backlight
  - LPT device
  - Power
  - TTL screen
  - USB port
  - VGA port

4.2.3 Installation Checklist

The following checklist is provided to ensure the NANO-GX is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The NANO-GX is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - Primary and secondary IDE device
  - SATA drives
  - Keyboard and mouse cable
  - Audio kit
  - Power supply
  - USB cable

- Serial port cable
- Parallel port cable

- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - Keyboard
  - Mouse
  - RS-232 serial communications device
  - Parallel port

4.2.4 SODIMM Installation

WARNING:

Using incorrectly specified SODIMM may cause permanently damage the NANO-GX. Please make sure the purchased SODIMM complies with the memory specifications of the NANO-GX. SODIMM specifications compliant with the NANO-GX are listed in **Chapter 2**.

To install a SODIMM into a SODIMM socket, please follow the steps below and refer **Figure 4-1**.

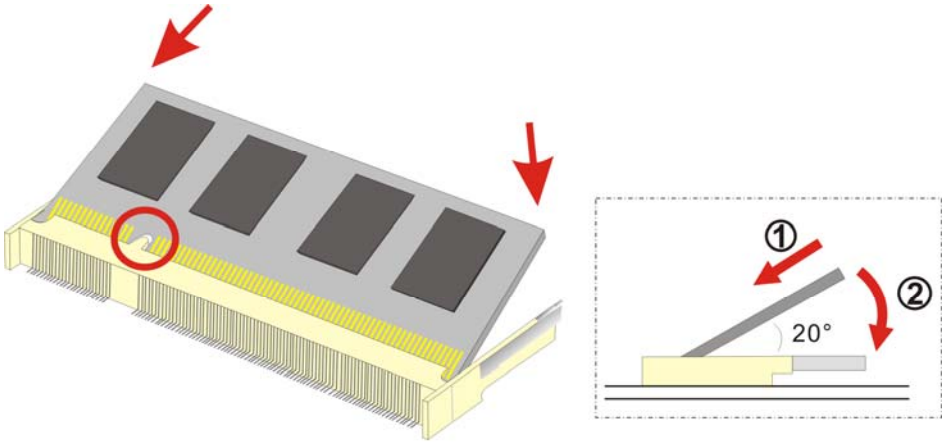


Figure 4-1: SODIMM Installation

Step 1: **Locate the SODIMM socket**. Place the NANO-GX on an anti-static pad with the solder side facing up.

Step 2: **Align the SODIMM with the socket**. The SODIMM must be oriented in such a way that the notch in the middle of the SODIMM must be aligned with the plastic bridge in the socket.

Step 3: **Insert the SODIMM**. Push the SODIMM chip into the socket at an angle. (See **Figure 4-1**)

Step 4: **Open the SODIMM socket arms**. Gently pull the arms of the SODIMM socket out and push the rear of the SODIMM down. (See **Figure 4-1**)

Step 5: **Secure the SODIMM**. Release the arms on the SODIMM socket. They clip into place and secure the SODIMM in the socket.

4.2.5 CF Card Installation

NOTE:

The NANO-GX can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install a CF card (Type 1 or Type 2) onto the NANO-GX, please follow the steps below:

Step 1: **Locate the CF card socket**. Place the NANO-GX on an anti-static pad with the solder side facing up. Locate the CF card.

Step 2: **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.

Step 3: **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 4-2**.

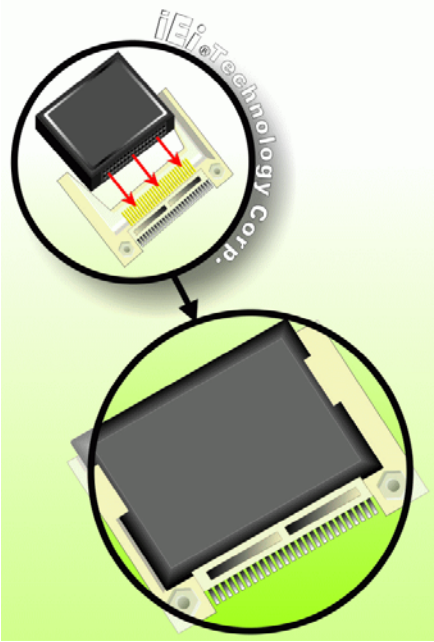
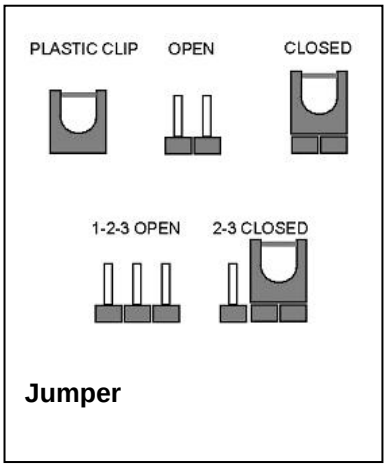


Figure 4-2: CF Card Installation

4.3 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the NANO-GX is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the NANO-GX are listed in **Table 4-1**.

Description	Label	Type
AT/ATX Power Mode Select	**JP2**	2-pin header
COM1/2 Port RI and Voltage Select (Optional)	**JP6**	10-pin header
CRT/LCD Mode Select	**JP3**	3-pin header
LCD Panel (LVDS/TTL) Voltage select	**JP7**	3-pin header
LCD Panel Shift Clock Setting	**JP5**	3-pin header
PC104 Plus VIO Voltage select jumper & SERIRQ Select	**JP1**	6-pin header
RS422/RS485 Select	**JP4**	3-pin header

Table 4-1: Jumpers

4.3.1 AT/ATX Power Mode Select

Jumper Label: **JP2**

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-3**

The **AT Power Mode Select** jumper specifies the systems power mode as AT or ATX. AT Power Select jumper settings are shown in **Table 4-2**.

JP2	Description	
Short	Use AT power	Default
Open	Use ATX power	

Table 4-2: AT Power Mode Select Jumper Settings

The location of the AT Power Select jumper is shown in **Figure 4-3** below.

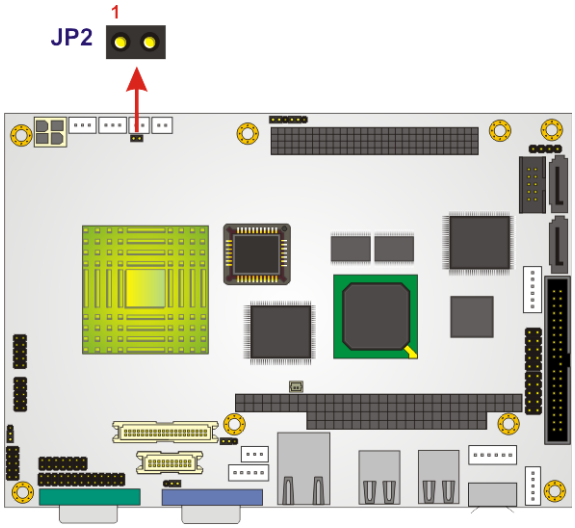


Figure 4-3: AT Power Mode Select Jumper Pinout Location

4.3.2 COM1/2 Port RI and Voltage Select (*Optional*)

Jumper Label:	**JP6**
Jumper Type:	10-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-5**

The **COM 1/2 Port RI and Voltage Select** jumper configures pin 9 on COM 1 and COM 2 as either a +5V, +12V power source or as a ring-in (RI) line. The jumper selection options are shown in **Table 4-3**. The jumper location is shown in **Figure 4-4**.

JP6	Description	
Short 1 – 3	COM 1 RI Pin use +12V	
Short 3 – 5	COM 1 RI Pin use +5V	
Short 7 – 9	COM 1 RI Pin use RI	Default
Short 2 – 4	COM 2 RI Pin use +12V	
Short 4 – 6	COM 2 RI Pin use +5V	
Short 8 – 10	COM 2 RI Pin use RI	Default

Table 4-3: COM 1/2 RI and Voltage Select Jumper Settings

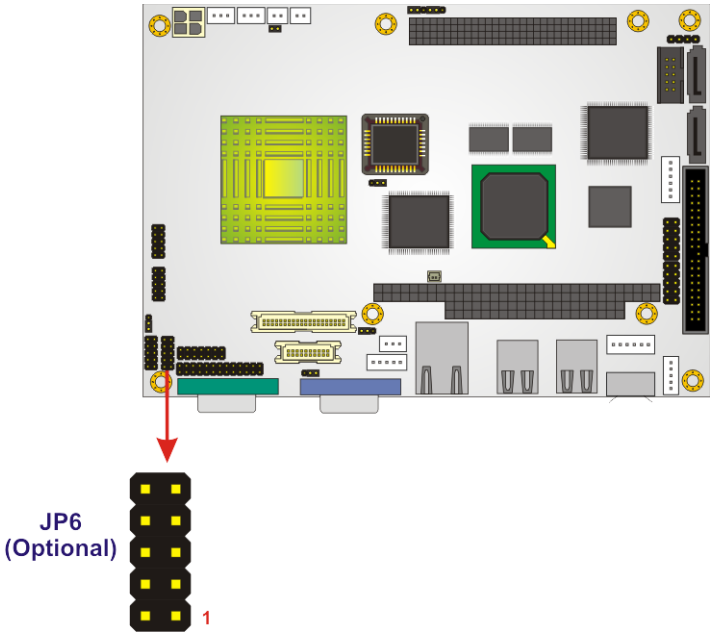


Figure 4-4: COM 1/2 RI and Voltage Select Jumper Pinout Location

4.3.3 CRT/LCD Mode Select

Jumper Label:	**JP3**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-4**
Jumper Location:	See **Figure 4-5**

The **CRT/LCD Mode Select** jumper allows the video mode of the NANO-GX to be selected. The CRT/LCD Mode Select jumper settings are shown in **Table 4-4**.

JP3	Description	
1-2	**LCD MODE**	
2-3	**CRT MODE**	Default

Table 4-4: CRT/LCD Mode Select Jumper Settings

The CRT/LCD Mode Select jumper location is shown in **Figure 4-5**.

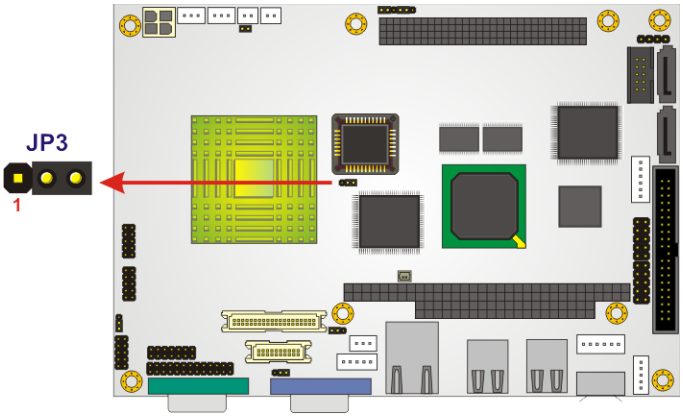


Figure 4-5: CRT/LCD Mode Select Jumper Pinout Location

4.3.4 LCD Panel (LVDS/TTL) Voltage Select

WARNING:

Permanent damage to the screen and NANO-GX may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that cam with the monitor to select the correct voltage.

Jumper Label:	**JP7**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-5**
Jumper Location:	See **Figure 4-6**

The **LCD Panel (LVDS/TTL) Voltage Select** jumper allows the LVDS screen voltage to be set. The jumper settings are shown in **Table 4-5**.

JP7	Description	
1-2	+3.3V LVDS	Default
2-3	+5V LVDS	

Table 4-5: LVDS Voltage Selection Jumper Settings

The **LCD Panel (LVDS/TTL) Voltage Select** jumper location is shown in **Figure 4-6**.

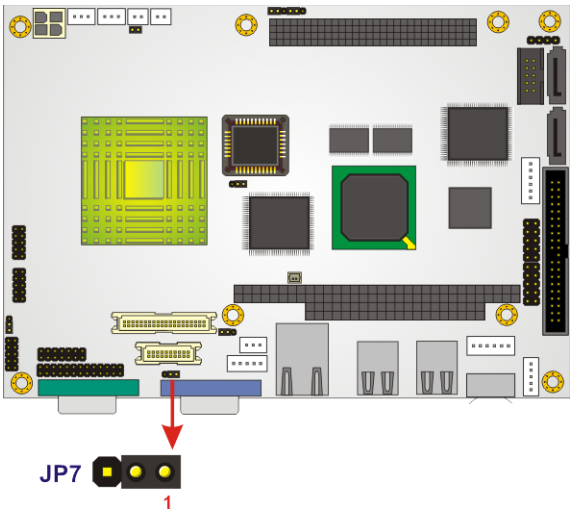


Figure 4-6: LCD Panel (LVDS/TTL) Voltage Select Jumper Pinout Location

4.3.5 LCD Panel Shift Clock Jumper

Jumper Label:	**JP5**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-6**
Jumper Location:	See **Figure 4-7**

The JP5 jumper sets the LCD panel shift clock.

JP5	Description	
Short 1-2	Normal Output	Default
Short 2-3	Invert Output	

Table 4-6: LCD Panel Shift Clock Jumper Settings

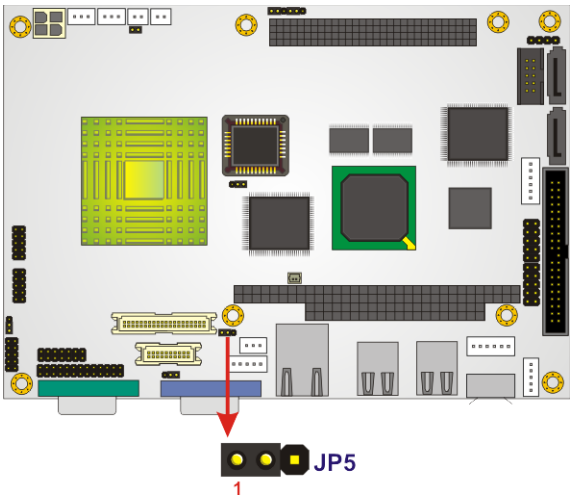


Figure 4-7: LCD Panel Shift Clock Jumper Pinout Location

4.3.6 PC/104-Plus VIO Voltage Select Jumper & SERIRQ Select

Jumper Label:	**JP1**
Jumper Type:	6-pin header
Jumper Settings:	See **Table 4-7**
Jumper Location:	See **Figure 4-8**

The JP1 jumper sets the voltage to the PC/104 connector and to reserve IRQ addresses for PCMCIA devices.

NOTE:

Serial IRQ can only work properly if PCMCIA supports Serial IRQ signal.

JP1	Description	
1-2	PC104 Plus VIO output voltage select 5V	
2-3	PC104 Plus VIO output voltage select 3.3V	
5-6 (short)	SERIRQ Enable	Default
5-6 (open)	SERIRQ Disable	

Table 4-7: PC/104-Plus VIO Voltage & SERIRQ Select Jumper Settings

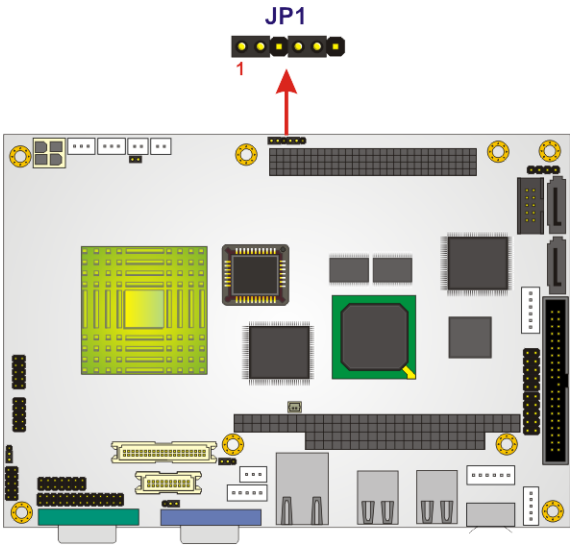


Figure 4-8: PC/104-Plus VIO Voltage & SERIRQ Select Jumper Pinout Location

4.3.7 RS-422/485 Serial Port Select Jumper

Jumper Label:	**JP4**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-8**
Jumper Location:	See **Figure 4-9**

The **RS-422/485 Serial Port Select** jumper configures the serial port connector as an RS-422 serial port or as an RS-485 serial port. The RS-422/485 Serial Port Select jumper selection options are shown in **Table 4-8**.

JP4	Description	
1 – 2	RS-422	Default
2 – 3	RS-485	

Table 4-8: RS-422/485 Serial Port Select Jumper Settings

The RS-422/485 Serial Port Select jumper location is shown in **Figure 4-9** below.

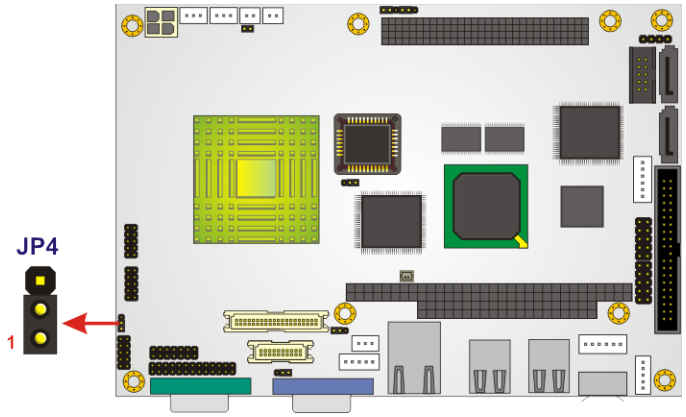


Figure 4-9: RS-422/485 Serial Port Select Jumper Pinout Location

4.4 Chassis Installation

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the NANO-GX must have air vents to allow cool air to move into the system and hot air to move out.

The NANO-GX must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.4.1 NANO-GX Installation

To install the NANO-GX motherboard into the chassis please refer to the reference material that came with the chassis.

4.5 Internal Peripheral Device Connections

The cables listed in **Table 4-9** are shipped with the NANO-GX.

Quantity	Type
1	ATA33 flat cable
2	RS-232 cables
1	KB/MS Y cable
2	SATA drive cables
1	SATA drive power cable

Table 4-9: IEI Provided Cables

4.5.1 ATA Flat Cable Connection

The ATA 33 flat cable connects the NANO-GX to one or two IDE devices. To connect an IDE HDD to the NANO-GX please follow the instructions below.

Step 1: **Locate the IDE connector**. The location/s of the IDE device connector/s is/are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 4-10**. A key on the front of the cable connector ensures it can only be inserted in one direction.

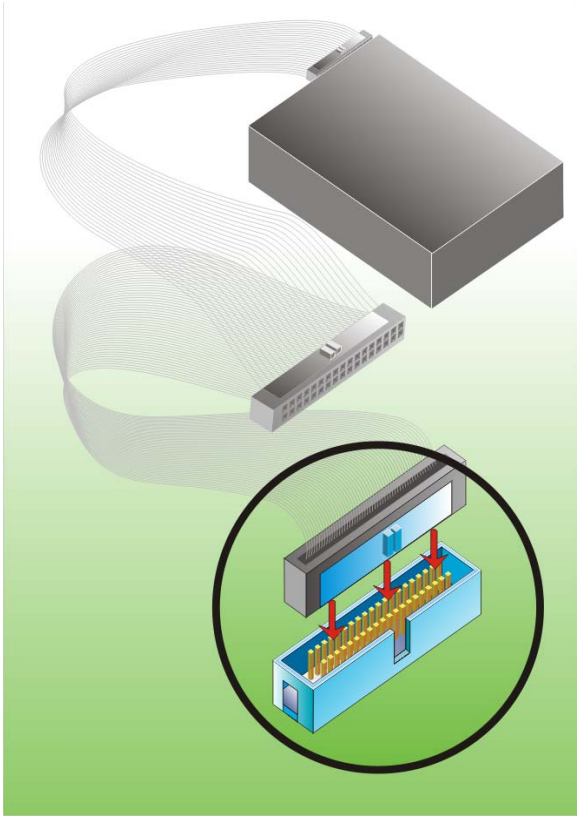


Figure 4-10: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

4.5.2 Keyboard/Mouse Y-cable Connector

The NANO-GX is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the NANO-GX and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on

the NANO-GX keyboard/mouse connector. See **Figure 4-11**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the NANO-GX, connect the cable connector to the onboard connectors. See **Figure 4-11**.

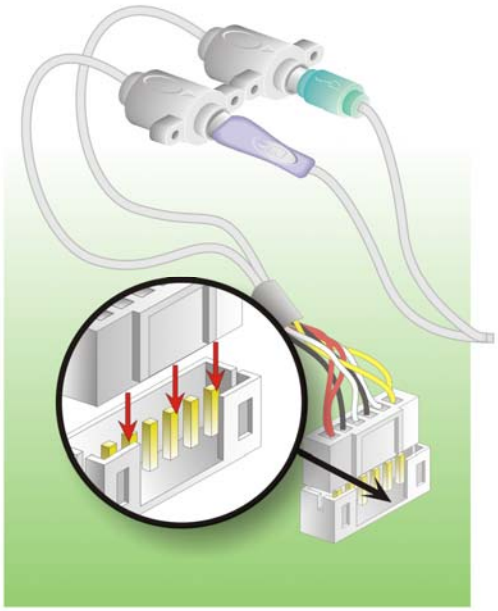


Figure 4-11: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.5.3 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 4-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

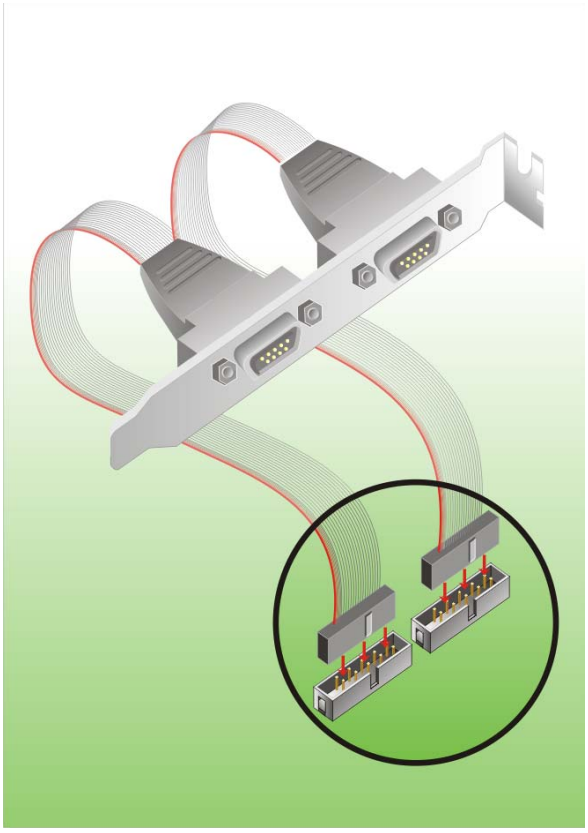


Figure 4-12: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please

refer to the reference material that came with the chassis.

4.5.4 SATA Drive Connection

The NANO-GX is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 4-13**.

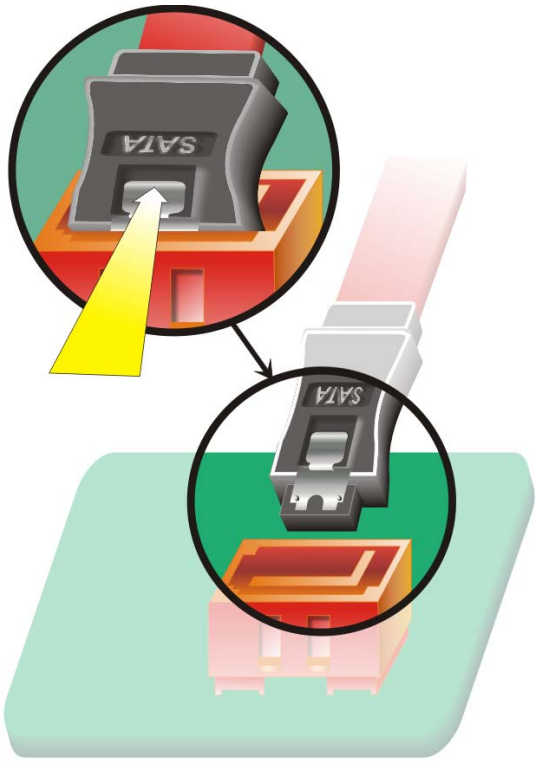


Figure 4-13: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-14**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-14**.

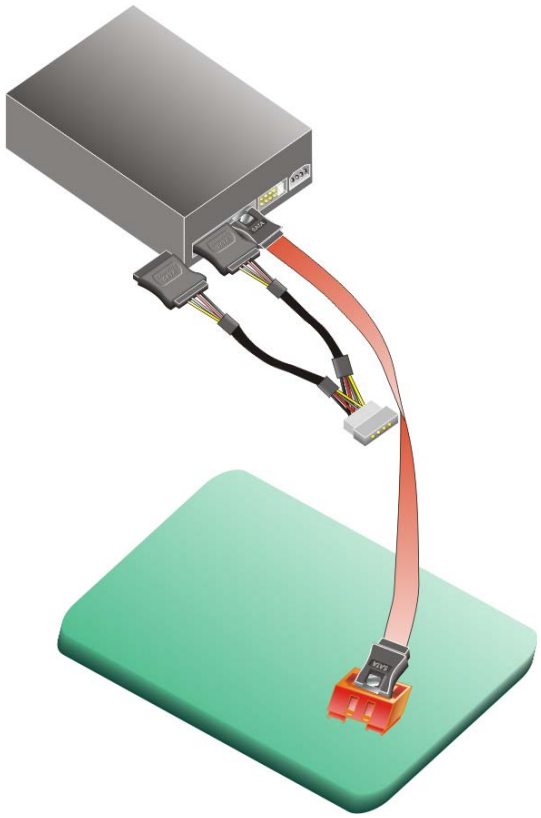


Figure 4-14: SATA Power Drive Connection

4.5.5 Audio Kit Installation

The Audio Kit that came with the NANO-GX connects to the 10-pin audio connector on the NANO-GX. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

Step 1: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 4-15**.

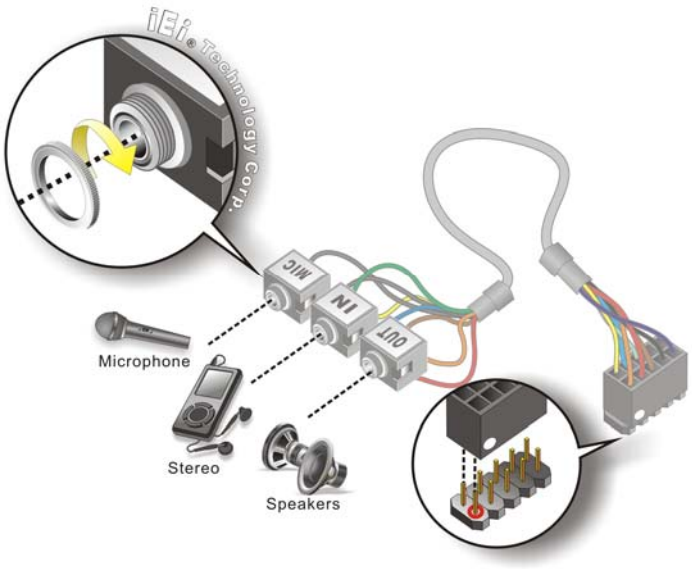


Figure 4-15: Audio Kit Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

4.6 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Serial port devices
- USB devices
- VGA monitors
- Parallel port devices
- RJ-45 Ethernet cable connectors
- Mouse and keyboard

To install these devices, connect the corresponding cable connector from the actual device to the corresponding NANO-GX external peripheral interface connector making sure the pins are properly aligned.

4.7 Software Installation

All the drivers for the NANO-GX are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 4-16**).

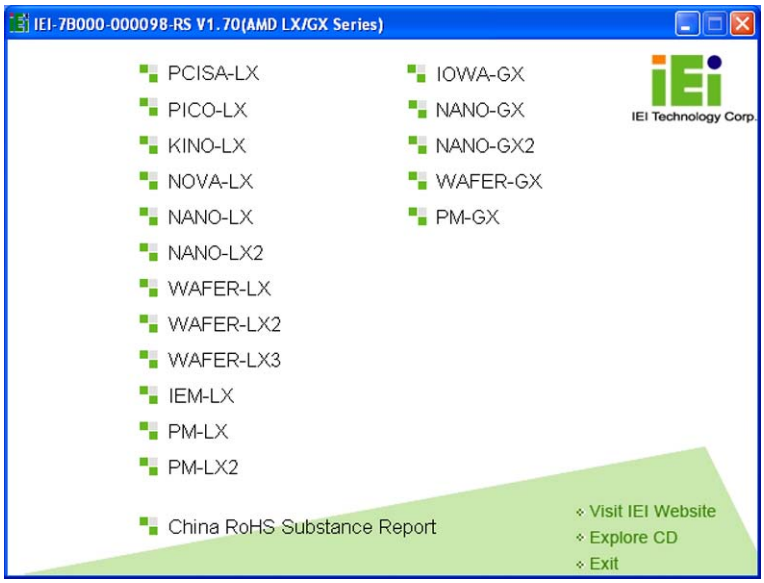


Figure 4-16: Introduction Screen

Step 3: Click NANO-GX.

Step 4: A new screen with a list of available drivers appears (**Figure 4-17**).

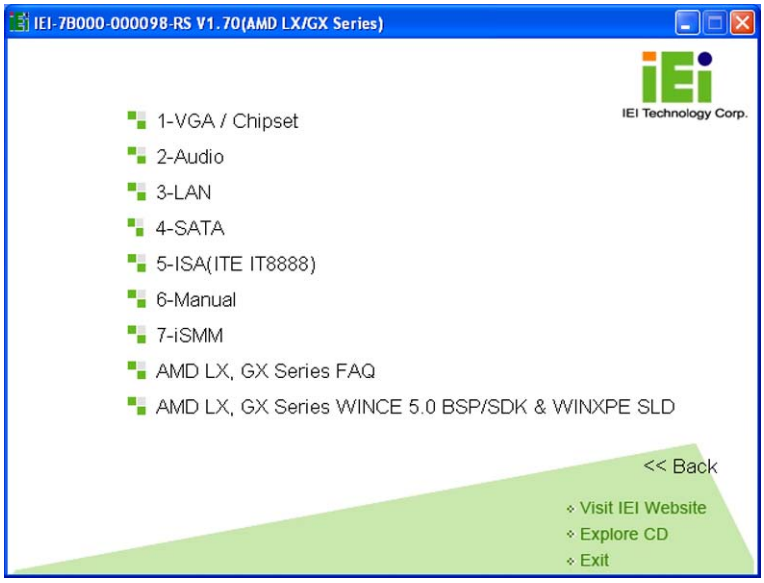


Figure 4-17: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

Chapter

5

Award BIOS

5.1 Introduction

A licensed copy of Phoenix Award BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The Phoenix Award BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the **PAGEUP** and **PAGEDOWN** keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown below.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+/Page up	Increase the numeric value or make changes
-/Page down	Decrease the numeric value or make changes
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu

F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Item help
F5	Previous values for the page menu items
F6	Fail-safe defaults for the current page menu items
F7	Optimized defaults for the current page menu items
F9	Menu in BIOS
F10	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the system cannot be booted after changes are made, restore the CMOS defaults. To restore CMOS defaults, follow these steps:

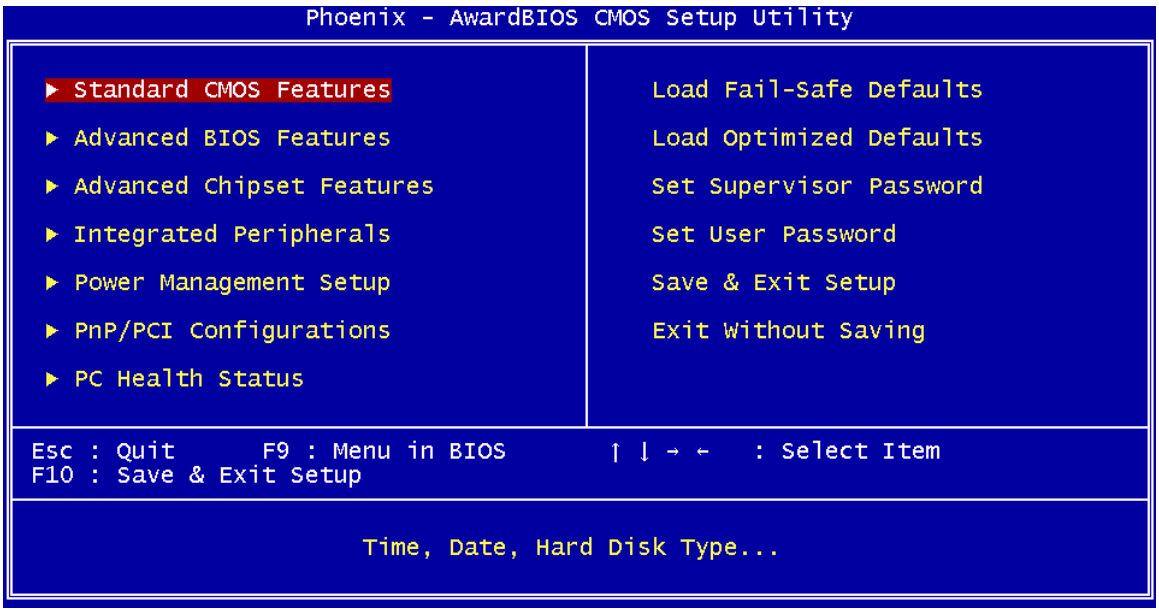
Step 1: Unplug the battery connector.

Step 2: Remove the battery.

Step 3: Plug in the battery connector.

5.1.5 Main BIOS Menu

When the BIOS opens, the **Main Menu** (**BIOS Menu 1**) appears.



BIOS Menu 1: Award BIOS CMOS Setup Utility

NOTE:

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS** Menu 1.

- **Standard CMOS Features**: Changes the basic system configuration.
- **Advanced BIOS Features**: Changes the advanced system settings.
- **Advanced Chipset Features**: Changes the chipset configuration features.
- **Integrated Peripherals**: Changes the settings for integrated peripherals.
- **Power Management Setup**: Configures power saving options.
- **PnP/PCI Configurations**: Changes the advanced PCI/PnP settings.
- **PC Health Status**: Monitors essential system parameters.

The following user configurable options are also available in **BIOS Menu 1**:

➔ **Load Fail-Safe Defaults**

Use the **Load Fail-Safe Defaults** option to load failsafe default values for each BIOS parameter in the setup menus. Press **F6** for this operation on any page.

➔ **Load Optimized Defaults**

Use the **Load Optimized Defaults** option to load optimal default values for each BIOS parameter in the setup menus. Press **F7** for this operation on any page.

➔ **Set Supervisor Password**

Use the **Set Supervisor Password** option to set the supervisor password. By default, no supervisor password is set. To install a supervisor password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password."** Type the password and press **ENTER**. Retype the original password into the "**Confirm Password**" dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the "**Enter Password**" dialogue box, and then press any key in the "**Password Disabled**" dialogue box.

➔ **Set User Password**

Use the **Set User Password** option to set the supervisor password. By default no user password is set. To install a user password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password.**" Type the password and press **ENTER**. Retype the original password into the "**Confirm Password**" dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the "**Enter Password**" dialogue box, and then press any key in the "**Password Disabled**" dialogue box.

➔ **Save & Exit Setup**

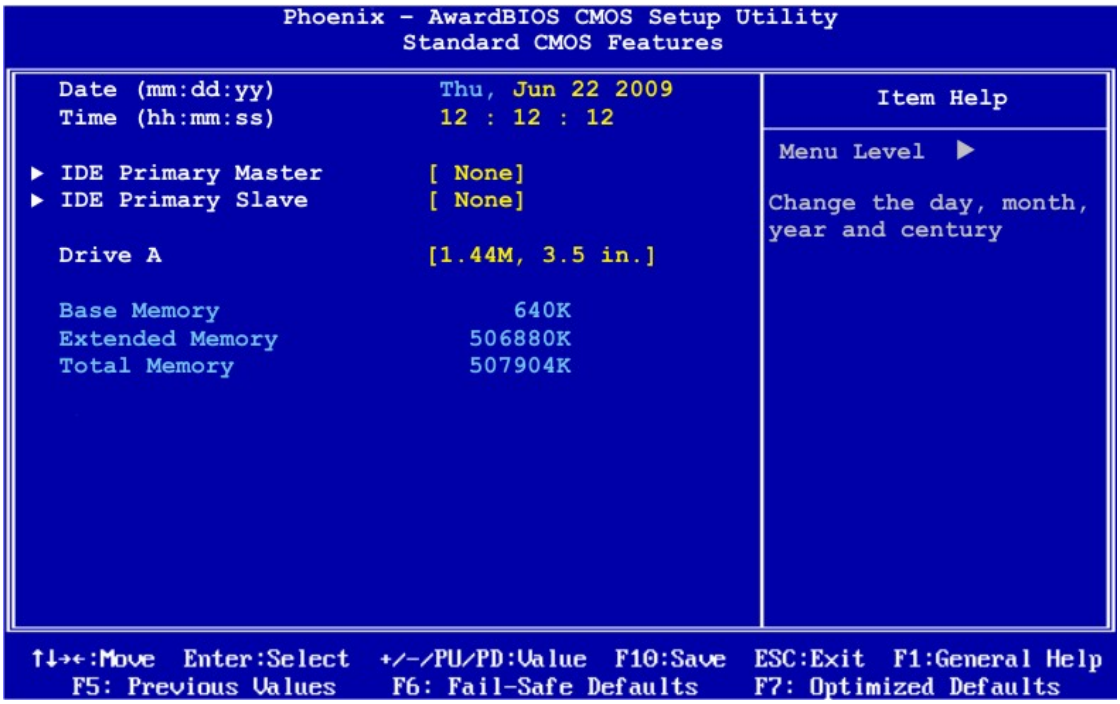
Use the **Save & Exit Setup** option to save any configuration changes made and exit the BIOS menus.

➔ **Exit Without Saving**

Use the **Exit Without Saving** option to exit the BIOS menus without saving any configuration changes.

5.2 Standard CMOS Features

Use the **Standard CMOS Features** BIOS menu (**BIOS Menu 2**) to set basic BIOS configuration options.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Thu, Jun 22 2009
Time (hh:mm:ss) 12 : 12 : 12
IDE Primary Master [None]
IDE Primary Slave [None]
Drive A [1.44M, 3.5 in.]
Base Memory 640K
Extended Memory 506880K
Total Memory 507904K
Item Help
Menu Level ▶
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 2: Standard CMOS Features

➔ **Date [Day mm:dd:yyyy]**

Use the **Date** option to set the system date

➔ **Time [hh:mm:ss]**

Use the **Time** option to set the system time.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS automatically detects the presence of IDE devices. The **Standard CMOS Features** menu shows the status of the auto detected IDE devices. The following IDE devices are detected and shown in the **Standard CMOS Features** menu:

- IDE Primary Master

- IDE Primary Slave

IDE device configurations are changed or set in the IDE Configuration menu (**BIOS Menu 3**). If an IDE device is detected, and one of the above listed two BIOS configuration options is selected, the IDE configuration options shown in **Section 5.2.1** appear.

➔ **Drive A/B [None]**

Use the **Drive A/B** configuration to specify the floppy drive type installed in the system. The floppy drive configuration options are:

- None (DEFAULT)
- 360K, 5.25 in.
- 1.2M, 5.25 in.
- 720K, 3.5 in.
- 1.44M, 3.5in
- 2.88M, 3.5 in.

➔ **Base Memory:**

The **Base Memory** is NOT user configurable. The POST determines the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed, or 640K for systems with 640K or more memory installed.

➔ **Extended Memory**

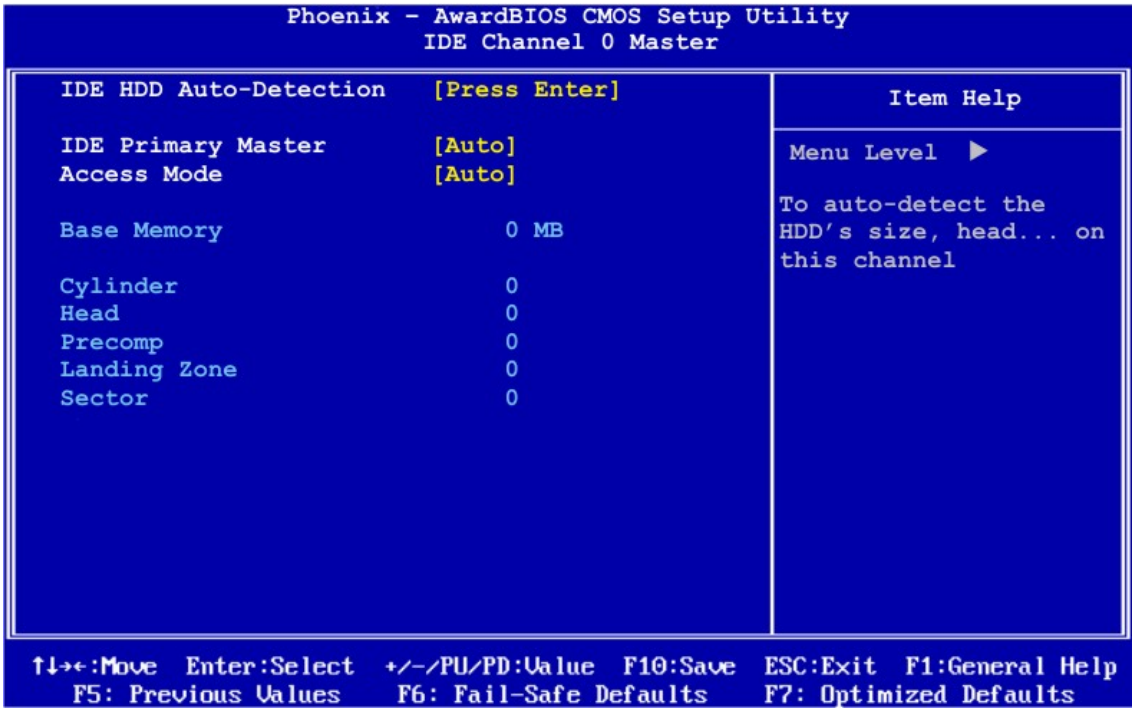
The **Extended Memory** is NOT user configurable. The BIOS determines how much extended memory is present during the POST. This is the amount of memory above 1MB located in the memory address map of the CPU.

➔ **Total Memory**

The **Total Memory** is NOT user configurable.

5.2.1 IDE Primary Master/Slave

Use the **IDE Primary Master/Slave** menu (**BIOS Menu 3**) to set or change the master/slave IDE configurations.


Phoenix - AwardBIOS CMOS Setup Utility
IDE Channel 0 Master
IDE HDD Auto-Detection [Press Enter]
IDE Primary Master [Auto]
Access Mode [Auto]
Base Memory 0 MB
Cylinder 0
Head 0
Precomp 0
Landing Zone 0
Sector 0
Item Help
Menu Level ▶
To auto-detect the HDD's size, head... on this channel
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 3: IDE Channel Master

➔ **IDE HDD Auto-Detection [Press Enter]**

Use the **IDE HDD Auto-Detection** option to enable BIOS to automatically detect the IDE settings. Select **IDE HDD Auto-Detection** and press **ENTER.** BIOS will automatically detect the HDD type. Do not set this option manually.

➔ **IDE Primary Master [Auto]**

Use the **IDE Primary Master** option to activate or deactivate the following drive channels:

- Channel 0 Master
- Channel 0 Slave
- Channel 1 Master
- Channel 0 Slave

➔ **None** If no drives are connected to the IDE channel select this option. Once set, this IDE channel becomes inaccessible and any drives attached to it are undetected.

➔ **Auto** (DEFAULT) Setting this option allows the device to be automatically detected by the BIOS.

➔ **Manual** Selecting this option allows manual configuration of the device on the IDE channel in BIOS.

➔ **Access Mode [Auto]**

The **Access Mode** option can only be configured if the BIOS configuration option is set to either **Manual** or **Auto**. Use the **Access Mode** option to determine the hard disk BIOS translation modes. Most systems now use hard drives with large capacities and therefore either the LBA translation mode or auto mode should be selected.

➔ **CHS** Select this mode if the HDD capacity is less than 504MB.

➔ **LBA** Select this mode if the HDD capacity is more than 8.4GB.

➔ **Large** This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.

➔ **Auto** (DEFAULT) If you are unsure of what access mode to set, select this option.

➔ **Capacity**

The **Capacity** specification indicates the storage capacity of the HDD installed in the system.

➔ **Cylinder**

The **Cylinder** specification indicates how many cylinders (tracks) are on the HDD installed in the system.

➔ **Head**

The **Head** specification indicates how many logical heads are on the HDD installed in the system.

➔ **Precomp**

The **Precomp** specification indicates on what track the write precompensation begins.

➔ **Landing Zone**

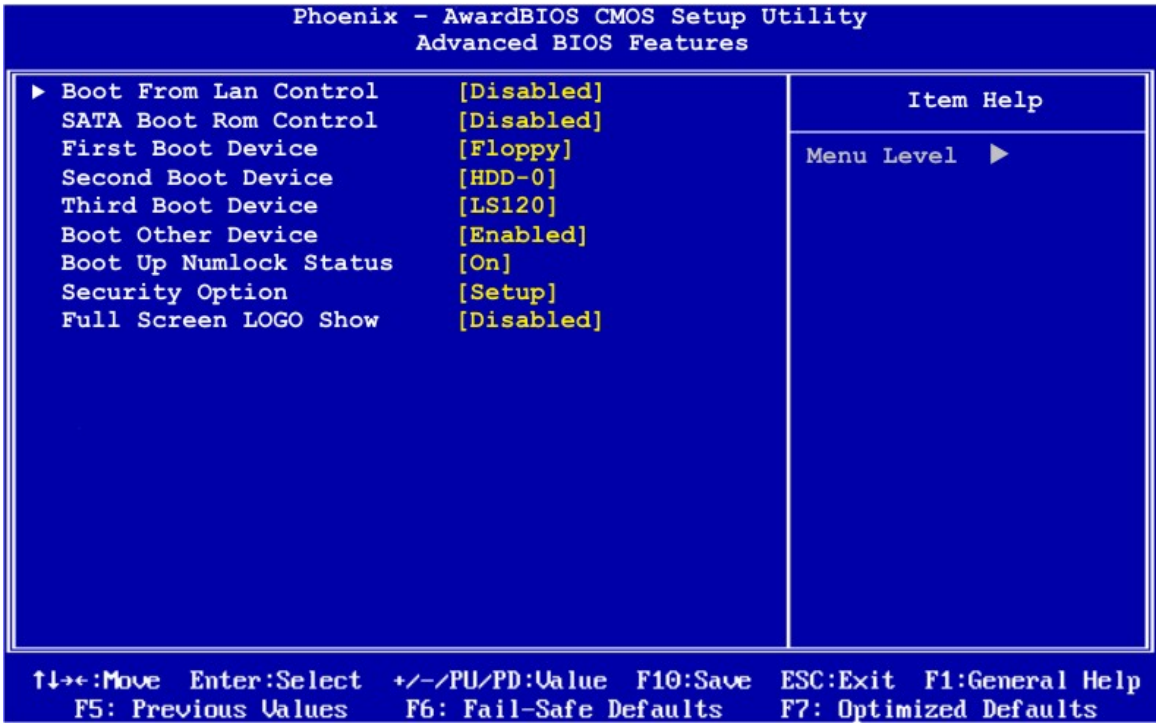
The **Landing Zone** specification indicates where the disk head will park itself after the system powers off.

➔ **Sector**

The **Sector** specification indicates how many logical sectors the HDD has been divided into.

5.3 Advanced BIOS Features

Use the **Advanced BIOS Features** menu (**BIOS Menu 4**) to configure the CPU and peripheral device configuration options.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
Boot From Lan Control [Disabled]
SATA Boot Rom Control [Disabled]
First Boot Device [Floppy]
Second Boot Device [HDD-0]
Third Boot Device [LS120]
Boot Other Device [Enabled]
Boot Up Numlock Status [On]
Security Option [Setup]
Full Screen LOGO Show [Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 4: Advanced BIOS Features

➔ **SATA Boot ROM Control [Disabled]**

Use the **SATA Boot ROM Control** option to configure SATA IDE use in DOS mode.

➔ **Disabled** (DEFAULT) Disables SATA IDE use in DOS mode

➔ **Enabled** Enables SATA IDE use in DOS mode

➔ **Boot From LAN Control [Enabled]**

The **Boot From LAN Control** option enables the system to be booted from a remote system.

➔ **Disabled** (DEFAULT) The system cannot be booted from a remote system through the LAN.

➔ **Enabled** The system can be booted from a remote system through the LAN.

➔ **Boot Device**

Use the **Boot Device** options to select the order of the devices the system boots from. There are three boot device configuration options:

- **First Boot Device** [Default: Floppy]
- **Second Boot Device** [Default: HDD-0]
- **Third Boot Device** [Default: LS120]

Using the default values, the system first looks for a HDD to boot from. If it cannot find an HDD, it boots from a CD-ROM. If both The HDD and the CD-ROM are unavailable, the system boots from a SCSI drive.

Boot Device configuration options are:

- Floppy
- LS120
- HDD-0
- SCSI
- CDROM
- HDD-1
- ZIP100
- USB-FDD
- USB-ZIP
- USB-CDROM
- USB-HDD
- LAN
- Disabled

➔ **Boot Other Device [Enabled]**

Use the **Boot Other Device** option to determine whether the system uses a second or third boot device if the first boot device is not found.

- ➔ **Disabled** The system does not look for second and third boot devices if the first one is not found.
- ➔ **Enabled** (DEFAULT) The system looks for second and third boot devices if the first one is not found.

➔ **Boot Up Numlock Status [On]**

Use the **Boot Up Numlock Status** option to specify the default state of the numeric keypad.

- ➔ **Off** The keys on the keypad are not activated.
- ➔ **On** (DEFAULT) Activates the keys on the keypad.

➔ **Security Option [Setup]**

Use the **Security Option** to limit access to both the system and Setup, or just Setup.

- ➔ **Setup** (DEFAULT) The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.
- ➔ **System** The system boots, but access to Setup is denied if the correct password is not entered at the prompt.

NOTE:

To disable security, select the password setting in the Main Menu. When asked to enter a password, do not type anything, press **ENTER** and the security is disabled. Once the security is disabled, the system boots and Setup can be accessed.

➔ **Full Screen Logo Show [Disabled]**

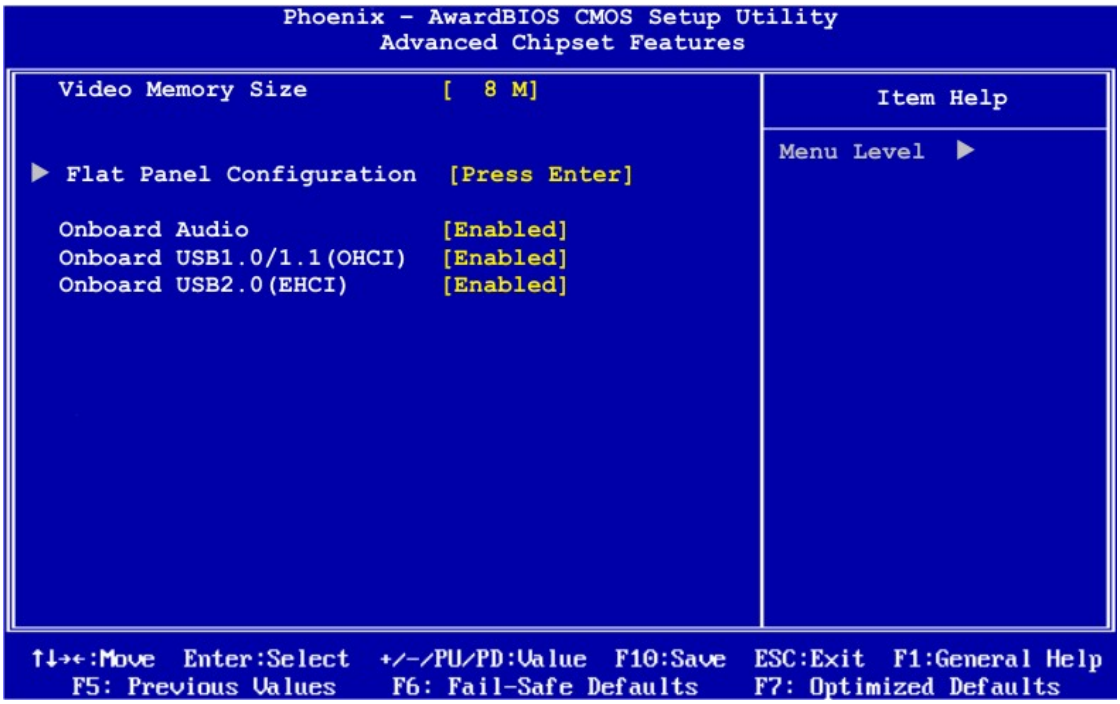
Use the **Full Screen Logo Show** option to specify if the IEI logo appears during the system boot-up process. If enabled, the boot up process may be delayed.

➔ **Disabled** (DEFAULT) IEI logo does not appear during boot up.

➔ **Enabled** IEI logo appears during boot up.

5.4 Advanced Chipset Features

Use the **Advanced Chipset Features** menu (**BIOS Menu 5**) to change chipset configuration options.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
Video Memory Size [8 M]
Item Help
Menu Level ▶
▶ Flat Panel Configuration [Press Enter]
Onboard Audio [Enabled]
Onboard USB1.0/1.1(OHCI) [Enabled]
Onboard USB2.0(EHCI) [Enabled]
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 5: Advanced Chipset Features

➔ **Video Memory Size [8M]**

Use the **Video Memory Size** option to determine how much memory is allocated to the video graphics device. The **Video Memory Size** options are:

- None

- 4M
- 6M
- 8M (DEFAULT)
- 12M
- 16M

➔ **Flat Panel Configuration [Press Enter]**

Use the **Flat Panel Configuration** option to open the **Flat Panel Configuration** menu. The **Flat Panel Configuration** options are shown in **Section 0**.

➔ **Onboard Audio [Enabled]**

Use the **OnBoard Audio** option to enable or disable the onboard codec.

➔ **Disabled** The onboard codec is disabled.

➔ **Enabled** (DEFAULT) The onboard codec is detected and enabled.

➔ **Onoard USB1.0/1.1 (OHCI) [Enabled]**

Use the **Onboard USB1.0/1.1 (OHCI)** option to enable or disable the onboard USB1.0/1.1 controller.

➔ **Disabled** The onboard controller is disabled.

➔ **Enabled** (DEFAULT) The onboard controller is detected and enabled.

➔ **Onboard USB2.0 (EHCI) [Enabled]**

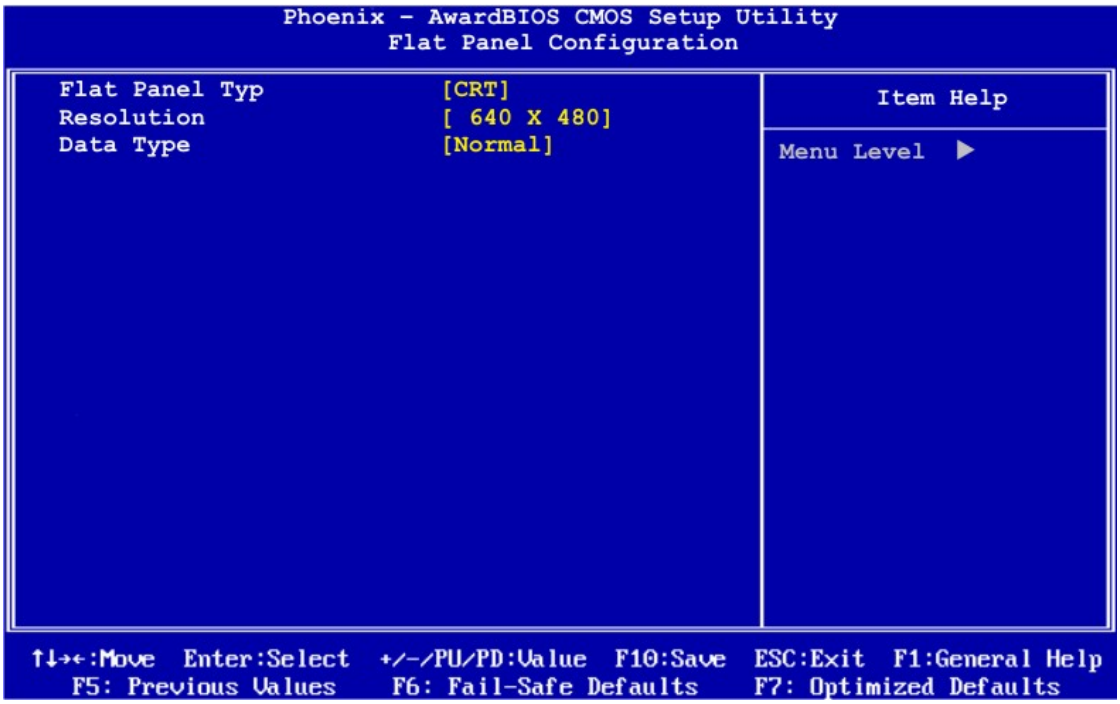
Use the **Onboard USB2.0 (EHCI)** option to enable or disable the onboard USB2.0 controller.

➔ **Disabled** The onboard controller is disabled.

➔ **Enabled** (DEFAULT) The onboard controller is detected and enabled.

5.4.1 Flat Panel Configuration

Use the **Flat Panel Configuration** menu (**BIOS Menu 6**) to set the configuration settings for the flat panel screen connected to the system.


Phoenix - AwardBIOS CMOS Setup Utility
Flat Panel Configuration
Flat Panel Typ [CRT]
Resolution [640 X 480]
Data Type [Normal]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 6: Flat Panel Configuration

➔ **Flat Panel Type [CRT]**

Use the **Flat Panel Type** option to specify the type of flat panel screen connected to the system.

- ➔ **CRT** (DEFAULT) Specifies the system is connected to a CRT display.
- ➔ **TFT** Specifies the system is connected to a TFT display.

➔ **x Resolution [640 x 480]**

The **Resolution** option can only be configured if the **Flat Panel Type** option is set to **TFT**. Use the **Resolution** option to set the resolution of the flat panel screen connected to the system. The **Resolution** options are:

- 640 x 480 (DEFAULT)
- 800 x 600
- 1024 x 768

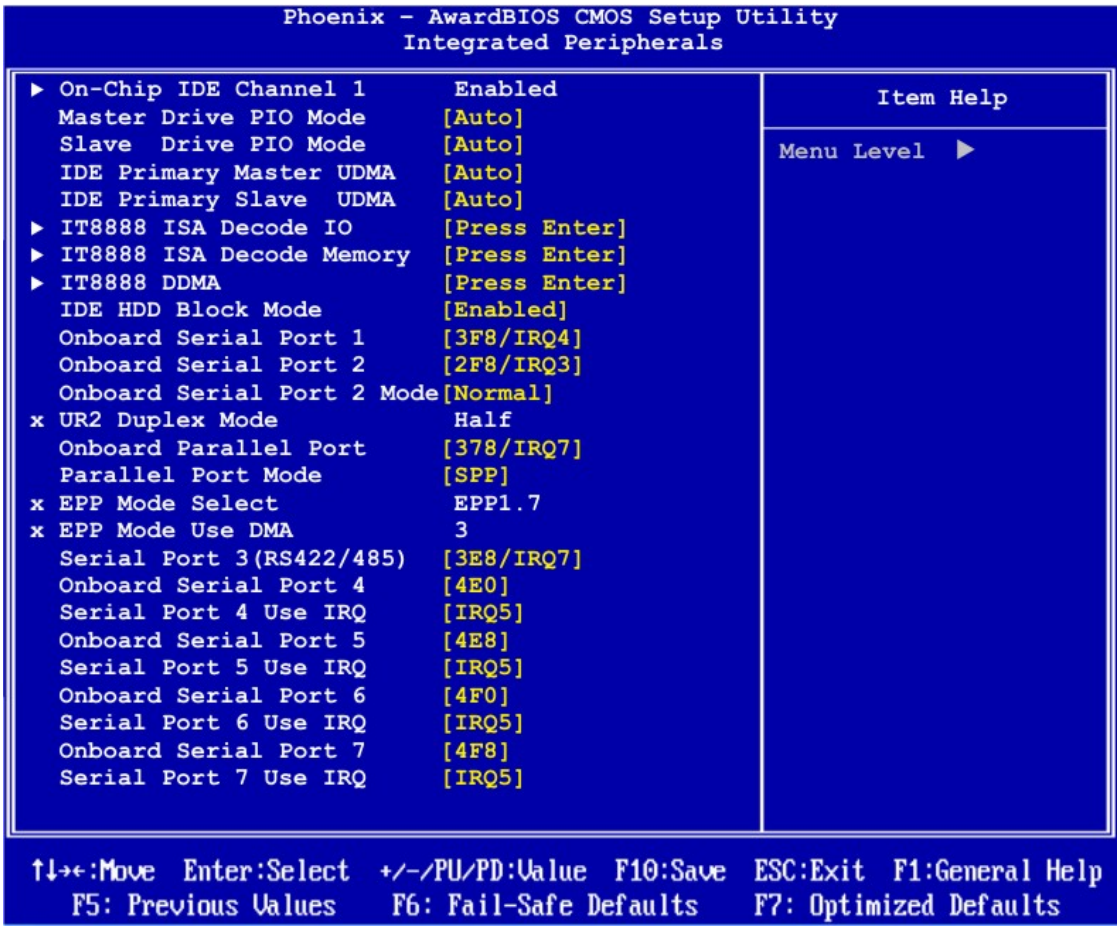
➔ **x Data Type [Normal]**

The **Data Type** option can only be configured if the **Flat Panel Type** option is not set to **TFT**. Use the **Data Type** option to set the bus type used to transfer data between the system and the flat panel screen connected to the system. The **Data Type** options are:

- Normal (DEFAULT)
- 2 X

5.5 Integrated Peripherals

Use the **Integrated Peripherals** menu (**BIOS Menu 7**) to change the configuration options for the attached peripheral devices.


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
▶ On-Chip IDE Channel 1 Enabled
Master Drive PIO Mode [Auto]
Slave Drive PIO Mode [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
▶ IT8888 ISA Decode IO [Press Enter]
▶ IT8888 ISA Decode Memory [Press Enter]
▶ IT8888 DDMA [Press Enter]
IDE HDD Block Mode [Enabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
Onboard Serial Port 2 Mode [Normal]
x UR2 Duplex Mode Half
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [SPP]
x EPP Mode Select EPP1.7
x EPP Mode Use DMA 3
Serial Port 3(RS422/485) [3E8/IRQ7]
Onboard Serial Port 4 [4E0]
Serial Port 4 Use IRQ [IRQ5]
Onboard Serial Port 5 [4E8]
Serial Port 5 Use IRQ [IRQ5]
Onboard Serial Port 6 [4F0]
Serial Port 6 Use IRQ [IRQ5]
Onboard Serial Port 7 [4F8]
Serial Port 7 Use IRQ [IRQ5]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 7: Integrated Peripherals

➔ **On-Chip IDE Channel 1 [Enabled]**

Use the **On-Chip IDE Channel 1** option to specify if the system uses the integrated primary IDE channel or not.

➔ **Disabled** The primary IDE channel is not used.

➔ **Enabled** (DEFAULT) The primary IDE channel is used.

➔ **Drive PIO Mode [Auto]**

Use the **Drive PIO Mode** options below to select the Programmed Input/Output (PIO) mode for the following HDDs:

- Master Drive PIO Mode
- Slave Drive PIO Mode

➔ **Auto** (DEFAULT) The computer selects the correct mode.

➔ **Mode 0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps.

➔ **Mode 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps.

➔ **Mode 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps.

➔ **Mode 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps.

➔ **Mode 4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps.

➔ **IDE UDMA [Auto]**

Use the **IDE UDMA** option below to select the Ultra DMA (UDMA) mode for the following HDDs:

- IDE Primary Master UDMA
- IDE Primary Slave UDMA

➔ **Auto** (DEFAULT) The computer selects the correct UDMA.

➔ **Disabled** The UDMA for the HDD device is disabled.

➔ **IT8888 ISA Decode IO [Press Enter]**

Use the IDE ISA Decode IO option to open the IT8888 ISA Decode I/O menu. The IT8888 ISA Decode I/O options are shown in **Section 5.5.1**.

➔ **IT8888 ISA Decode Memory [Press Enter]**

Use the IDE ISA Decode Memory option to open the IT8888 ISA Decode Memory menu. The IT8888 ISA Decode Memory options are shown in **Section 5.5.2**.

➔ **IT8888 DDMA[Press Enter]**

Use the IDE DDMA option to open the IT8888 DDMA menu. The IT8888 DDMA options are shown in **Section 5.5.3**.

➔ **IDE HDD Block Mode [Enabled]**

If the drive connected to the system supports block mode, use the **IDE HDD Block Mode** option to enable the system to detect the optimal number of block read/writes per sector the system IDE drive can support. Block mode is also called block transfer, multiple commands, or multiple sector read/write.

➔ **Disabled** Block mode is not supported.

➔ **Enabled** (DEFAULT) Block mode is supported.

➔ **Onboard Serial Port 1 [3F8/IRQ4]**

Use the **Onboard Serial Port 1** option to select the I/O address and IRQ for the onboard serial port 1. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 1** options are:

- Disabled
- 3F8/IRQ4 (DEFAULT)
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

➔ **Onboard Serial Port 2 [2F8/IRQ3]**

Use the **Onboard Serial Port 2** option to select the I/O address and IRQ for the onboard serial port 2. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 2** options are:

- Disabled
- 3F8/IRQ4
- 2F8/IRQ3 (DEFAULT)
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

➔ **x UR2 Duplex Mode [Half]**

Use the **UR2 Duplex Mode** option to specify the transmission mode for the IR port device.

➔ **Full**		Simultaneous bi-directional transmission occurs.
➔ **Half**	(DEFAULT)	Transmission only occurs in one direction at a time.

➔ **Onboard Parallel Port [378/IRQ7]**

Use the **Onboard Parallel Port** option to specify a logical LPT port address and corresponding interrupt for the physical parallel port. The **Onboard Parallel Port** options are:

- Disabled
- 378/IRQ7 (DEFAULT)
- 3BC/IRQ7

➔ **Parallel Port Mode [SPP]**

Use the **Parallel Port Mode** option to select parallel port operation mode.

➔ **SPP**	(DEFAULT)	The parallel port operates in the standard parallel port (SPP) mode. This parallel port mode works with most parallel port devices but is slow.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

➔ **ECP+EPP** The parallel port is compatible with both ECP and EPP devices.

➔ **Normal** The normal parallel port mode is the standard mode for parallel port operation.

➔ **x EPP Mode Select [EPP1.7]**

The **EPP Mode Select** option is only available if the **Parallel Port Mode** option is set to EPP mode. Use the **EPP Mode Select** option to select the parallel port mode standard for the parallel port.

➔ **EPP1.9** EPP 1.9 is selected as the EPP standard.

➔ **EPP1.7** (DEFAULT) EPP 1.7 is selected as the EPP standard.

➔ **x ECP Mode Use DMA [3]**

The **ECP Mode Use DMA** option is only available if the **Parallel Port Mode** option is set to ECP mode. Use the **ECP Mode Use DMA** option to specify the DMA channel the parallel port must use in the ECP mode.

➔ **1** The parallel port uses DMA Channel 1 in ECP mode.

➔ **3** (DEFAULT) The parallel port uses DMA Channel 3 in ECP mode.

➔ **Onboard Serial Port 3 [3E8]**

Use the **Onboard Serial Port 3** option to select the base addresses for serial port 3.

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3F8**		Serial port 3 I/O port address is 3F8
➔ **2F8**		Serial port 3 I/O port address is 2F8
➔ **3E8**	DEFAULT	Serial port 3 I/O port address is 3E8
➔ **2E8**		Serial port 3 I/O port address is 2E8

➔ **Serial Port 3 Use IRQ [IRQ7]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

➔ **IRQ5**		Serial port 3 IRQ address is IRQ5
➔ **IRQ7**	DEFAULT	Serial port 3 IRQ address is IRQ7
➔ **IRQ10**		Serial port 3 IRQ address is IRQ10
➔ **IRQ11**		Serial port 3 IRQ address is IRQ11

➔ **Onboard Serial Port 4 [2E8]**

Use the **Onboard Serial Port 4** option to select the base addresses for serial port 4.

➔ **Disabled**		No base address is assigned to serial port 4
➔ **3F8**		Serial port 4 I/O port address is 3F8
➔ **2F8**		Serial port 4 I/O port address is 2F8
➔ **3E8**	DEFAULT	Serial port 4 I/O port address is 3E8
➔ **2E8**		Serial port 4 I/O port address is 2E8

➔ **Serial Port 4 Use IRQ [IRQ7]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **IRQ5** Serial port 4 IRQ address is IRQ5
- ➔ **IRQ7** DEFAULT Serial port 4 IRQ address is IRQ7
- ➔ **IRQ10** Serial port 4 IRQ address is IRQ10
- ➔ **IRQ11** Serial port 4 IRQ address is IRQ11

➔ **Onboard Serial Port 5 [4E0]**

Use the **Onboard Serial Port 5** option to select the base address for serial port 5.

- ➔ **Disabled** DEFAULT No base address is assigned to serial port 5
- ➔ **4E0** Serial port 5 I/O port address is 4E0
- ➔ **4F8** Serial port 5 I/O port address is 4F8

➔ **Serial Port 5 Use IRQ [IRQ5]**

Use the **Serial Port5 IRQ** option to select the base address for serial port 5.

- ➔ **IRQ5** DEFAULT Serial port 5 IRQ address is IRQ5
- ➔ **IRQ7** Serial port 5 IRQ address is IRQ7
- ➔ **IRQ10** Serial port 5 IRQ address is IRQ10
- ➔ **IRQ11** Serial port 5 IRQ address is IRQ11

➔ **Onboard Serial Port 6 [4E8]**

Use the **Onboard Serial Port 6** option to select the base address for serial port 6.

- ➔ **Disabled** No base address is assigned to serial port 6
- ➔ **4F8** Serial port 6 I/O port address is 4F8
- ➔ **4E8** DEFAULT Serial port 6 I/O port address is 4E8

➔ **Serial Port 6 Use IRQ [IRQ10]**

Use the **Serial Port 6 Use IRQ** option to select the interrupt address for serial port 6.

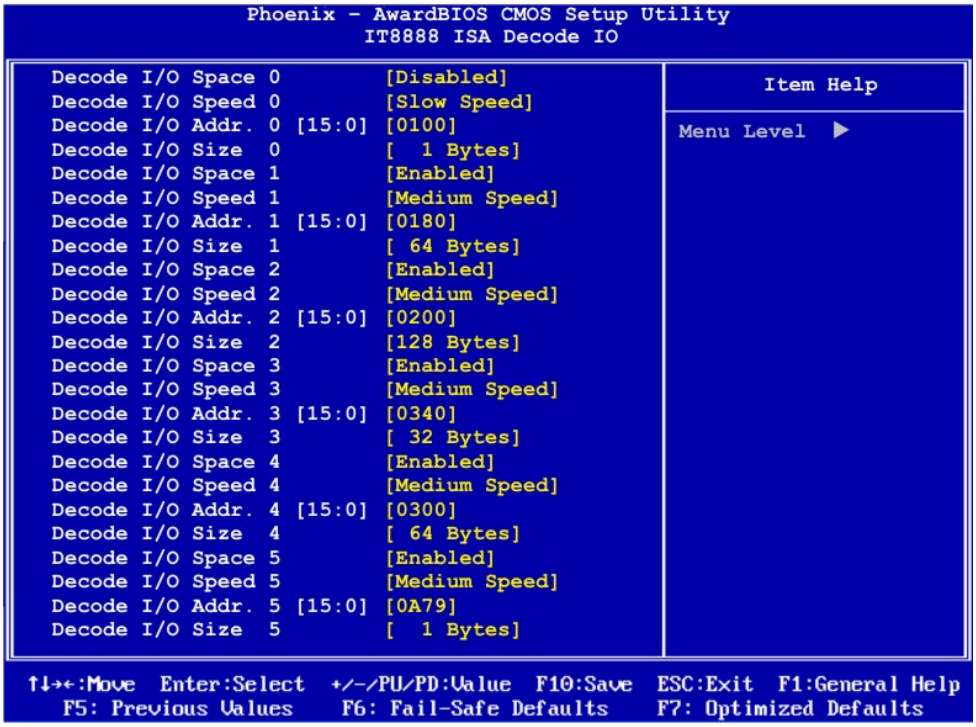
➔ **IRQ5**		Serial port 5 IRQ address is IRQ5
➔ **IRQ7**		Serial port 5 IRQ address is IRQ7
➔ **IRQ10**		Serial port 5 IRQ address is IRQ10
➔ **IRQ11**	DEFAULT	Serial port 5 IRQ address is IRQ11

5.5.1 IT8888 ISA Decode IO

NOTE:

Five PCI-104 devices can be stacked onto the NANO-GX motherboard. If these devices are stacked onto the board, the ISA bus space should be enabled. If no PCI-104 devices are being used, disable all the buses. Disabling these buses frees up system resources that can be allocated to other system applications.

Use the **IT8888 ISA Decode IO** menu (**BIOS Menu 8**) to set the IO memory range for the onboard ISA.


Phoenix - AwardBIOS CMOS Setup Utility
IT8888 ISA Decode IO
Decode I/O Space 0 [Disabled]
Decode I/O Speed 0 [Slow Speed]
Decode I/O Addr. 0 [15:0] [0100]
Decode I/O Size 0 [1 Bytes]
Decode I/O Space 1 [Enabled]
Decode I/O Speed 1 [Medium Speed]
Decode I/O Addr. 1 [15:0] [0180]
Decode I/O Size 1 [64 Bytes]
Decode I/O Space 2 [Enabled]
Decode I/O Speed 2 [Medium Speed]
Decode I/O Addr. 2 [15:0] [0200]
Decode I/O Size 2 [128 Bytes]
Decode I/O Space 3 [Enabled]
Decode I/O Speed 3 [Medium Speed]
Decode I/O Addr. 3 [15:0] [0340]
Decode I/O Size 3 [32 Bytes]
Decode I/O Space 4 [Enabled]
Decode I/O Speed 4 [Medium Speed]
Decode I/O Addr. 4 [15:0] [0300]
Decode I/O Size 4 [64 Bytes]
Decode I/O Space 5 [Enabled]
Decode I/O Speed 5 [Medium Speed]
Decode I/O Addr. 5 [15:0] [0A79]
Decode I/O Size 5 [1 Bytes]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 8: IT8888 ISA Decode IO

The **IT8888 ISA Decode IO** menu has the following common options:

- Decode I/O Space N
- Decode I/O Speed N
- Decode I/O Addr. N [15:0]
- Decode I/O Size N

Where N is an integer in the set [1, 2, 3, 4, 5] and represents a set for the PCI-104 devices that are attached to the system.

➔ **Decode IO Space N [Enabled]**

Use the **Decode IO Space N** option to allocate system resources to the ISA bridge and to enable the Nth PCI-104 to function correctly.

➔ **Disabled** The Nth IO set is disabled and the system resources are reallocated to other applications.

➔ **Enabled** (DEFAULT) The Nth IO set is enabled and dedicated system resources are allocated to the Nth ISA bus.

➔ **Decode IO Speed N [Slow Speed]**

Use the **Decode IO Speed N** option to specify the speed of the Nth ISA bus. The following options are available:

- Fast Speed
- Middle Speed
- Slow Speed
- Subtractive Speed

➔ **Decode IO Address N 0:15 [xx]**

Use the **Decode IO Address N 0:15** option to allocate an address to the ISA bus. The address may range from **0001** to **FFFF**.

➔ **Decode IO Size N**

Use the **Decode IO Size N** option to specify the size of the ISA bus. The following options are available:

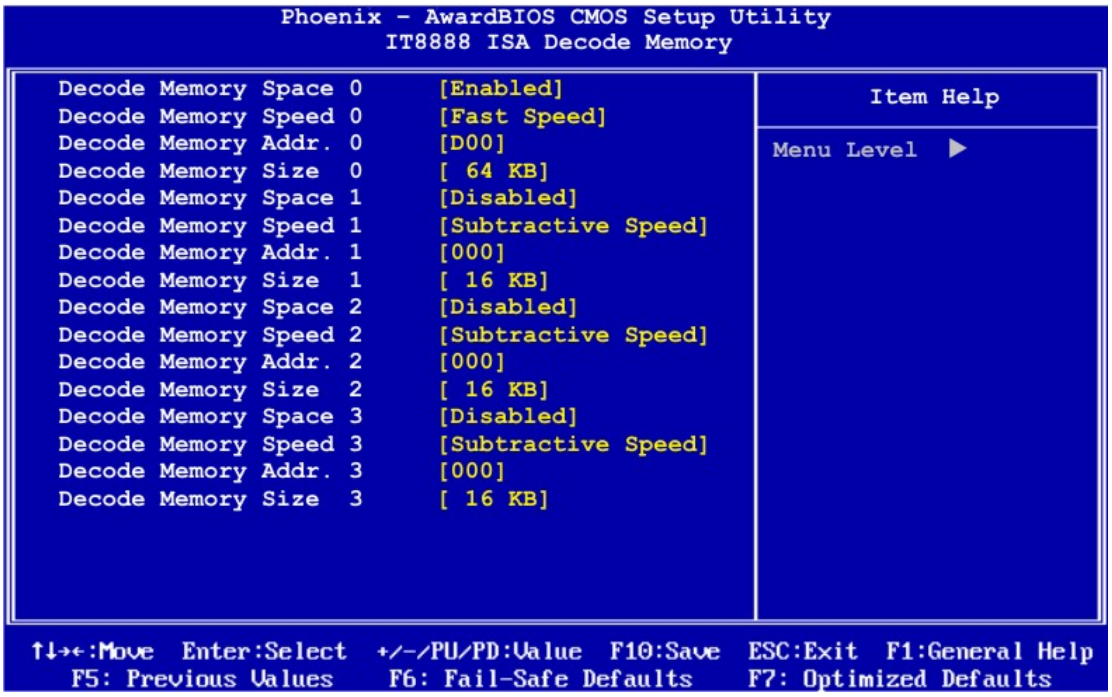
- 1 Byte
- 2 Bytes
- 4 Bytes
- 8 Bytes
- 16 Bytes
- 32 Bytes
- 64 Bytes
- 128 Bytes

5.5.2 IT8888 ISA Decode Memory

NOTE:

Five PCI-104 devices can be stacked onto the NANO-GX motherboard. If these devices are stacked onto the board, the ISA memory should be enabled. If no PCI-104 devices are being used, disable all the memory allocations for these buses. Disabling the memory allocations frees up system resources that can be allocated to other system applications.

Use the **IT8888 ISA Decode Memory** (**BIOS Menu 9**) to set the resources for the onboard ISA bus.


Phoenix - AwardBIOS CMOS Setup Utility
IT8888 ISA Decode Memory
Decode Memory Space 0 [Enabled]
Decode Memory Speed 0 [Fast Speed]
Decode Memory Addr. 0 [D00]
Decode Memory Size 0 [64 KB]
Decode Memory Space 1 [Disabled]
Decode Memory Speed 1 [Subtractive Speed]
Decode Memory Addr. 1 [000]
Decode Memory Size 1 [16 KB]
Decode Memory Space 2 [Disabled]
Decode Memory Speed 2 [Subtractive Speed]
Decode Memory Addr. 2 [000]
Decode Memory Size 2 [16 KB]
Decode Memory Space 3 [Disabled]
Decode Memory Speed 3 [Subtractive Speed]
Decode Memory Addr. 3 [000]
Decode Memory Size 3 [16 KB]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 9: IT8888 ISA Decode Memory

The **IT8888 ISA Decode IO Memory** menu has the following common options:

- Decode Memory Space N
- Decode Memory Speed N

- Decode Memory Addr. N [15:0]
- Decode Memory Size N

Where N is an integer in the set [1, 2, 3, 4, 5] and represents a memory set for the PCI-104 devices that are attached to the system.

➔ **Decode Memory Space N [Disabled]**

Use the **Decode IO Memory N** option to allocate memory resources to the ISA bridge and to enable the PCI-104 to function correctly.

➔ **Disabled** (DEFAULT) The Nth memory set is disabled and the system memory resources are reallocated to other applications.

➔ **Enabled** The Nth memory set is enabled and dedicated system memory resources are allocated to the ISA bus.

➔ **Decode Memory Speed N [Fast Speed]**

Use the **Decode Memory Speed N** option to specify the memory speed of the ISA bus. The following options are available:

- Subtractive Speed
- Slow Speed
- Medium Speed
- Fast Speed

➔ **Decode Memory Address N [xx]**

Use the **Decode Memory Address N** option to allocate an address to the memory of the ISA bus. The address may range from **0001** to **FFFF**.

➔ **Decode Memory Size N [xx]**

Use the Decode Memory **Size N** option to specify the memory size of the ISA bus. The following options are available:

- 16 KB
- 32 KB

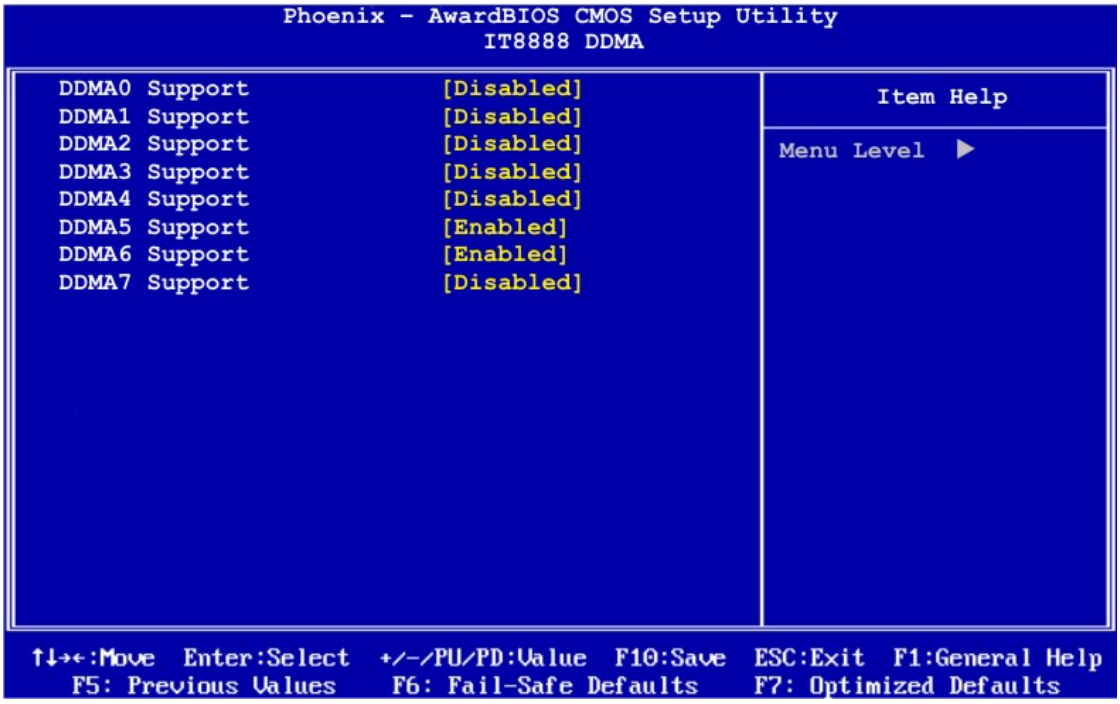
- 64 KB
- 128 KB
- 256 KB
- 512 KB
- 1 MB
- 2 MB

5.5.3 IT8888 DDMA

NOTE:

Five PCI-104 devices can be stacked onto the NANO-GX motherboard. If these devices are stacked onto the board, the ISA DDMA channel support should be enabled if the PCI-104 requires the allocation of that channel. If no PCI-104 devices are being used, disable all the channels. Disabling these channels frees up system resources that can be allocated to other system applications.

Use the **IT8888 DDMA** menu (**BIOS Menu 10**) to enable or disable the DDMA channel allocation for the PC-104 devices.



BIOS Menu 10: IT8888 DDMA

The **IT8888 DDMA** menu has the following option:

- DDMA N Support

Where N is an integer in the set [1, 2, 3, 4, 5] and represents a DDMA channel for the PCI-104 devices that are attached to the system.

➔ **DDMA N Support [Enabled]**

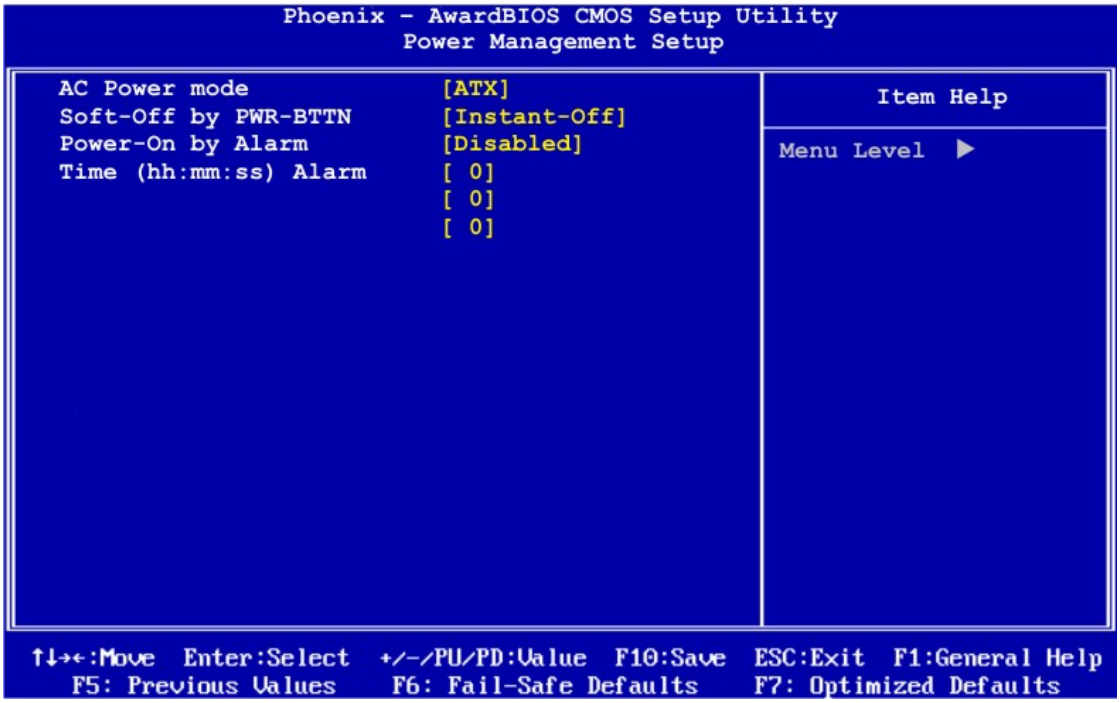
Use the **DDMA N Support** option to enable or disable Distributed DMA channels to enable the PCI-104 devices to function correctly.

➔ **Disabled** The Nth DDMA channel is disabled.

➔ **Enabled** (DEFAULT) The Nth DDMA channel is enabled.

5.6 Power Management Setup

Use the **Power Management Setup** menu (**BIOS Menu 11**) to set the BIOS power management and saving features.


Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
AC Power mode [ATX]
Soft-Off by PWR-BTTN [Instant-Off]
Power-On by Alarm [Disabled]
Time (hh:mm:ss) Alarm [0]
[0]
[0]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 11: Power Management Setup

➔ **Power-On by Alarm [Disabled]**

Use the **Power-On by Alarm** option to specify when the computer is roused from a suspended state.

➔ **Disabled** (DEFAULT) The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

➔ **Time Alarm**

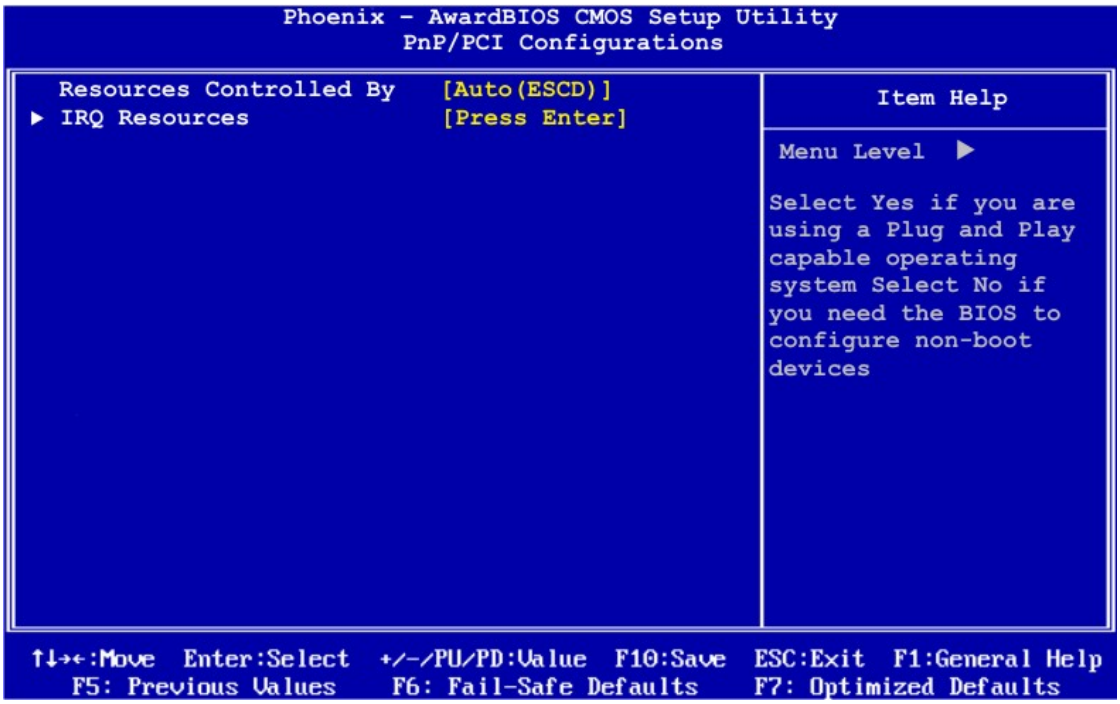
After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

➔ **Time (hh:mm:ss) Alarm**

Use the **Time Alarm** function to set the alarm time by hour (hh), minutes (mm) and seconds (ss).

5.7 PnP/PCI Configurations

Use the **PnP/PCI Configurations** menu (**BIOS Menu 12**) to set the plug and play, and PCI options.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Resources Controlled By [Auto(ESCD)]
▶ IRQ Resources [Press Enter]
Item Help
Menu Level ▶
Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 12: PnP/PCI Configurations

➔ **Resources Controlled By [Auto (ESCD)]**

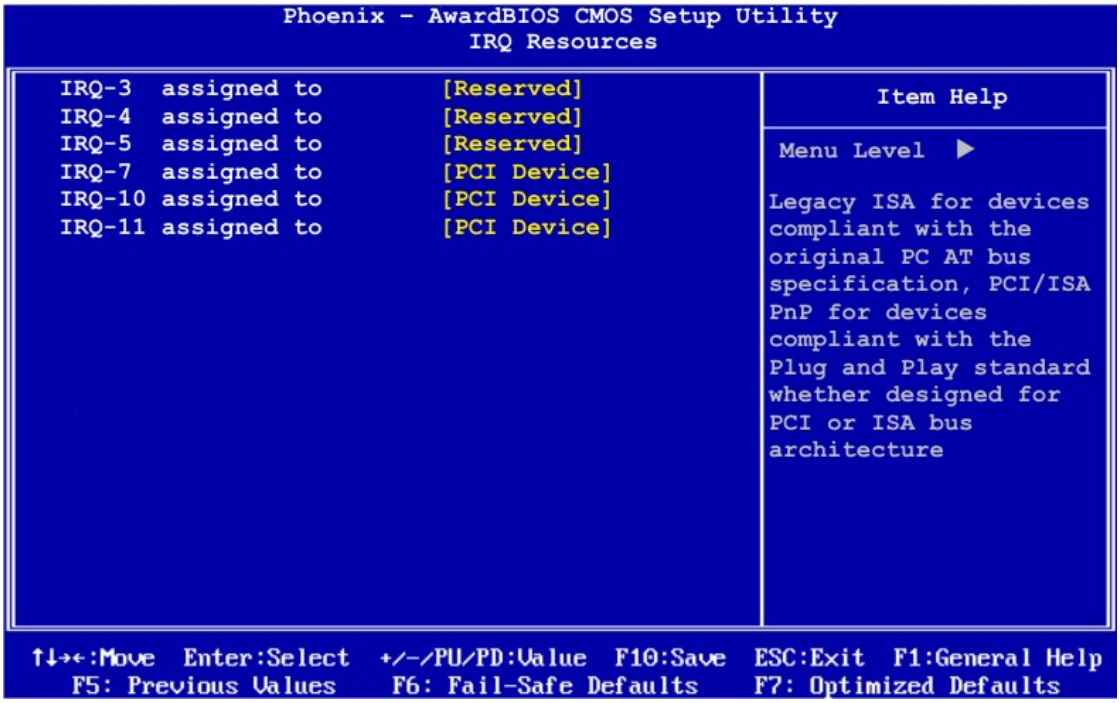
Use the **Resources Controlled By** option to either manually configure all the boot and plug and play devices, or allow BIOS to configure these devices automatically. If BIOS is allowed to configure the devices automatically IRQs, DMA and memory base address fields cannot be set manually.

➔ **Auto(ESCD)** (DEFAULT) BIOS automatically configures plug and play devices as well as boot devices.

➔ **Manual** Manually configure the plug and play devices and any other boot devices.

➔ **x IRQ Resources [Press Enter]**

The **IRQ Resources** option (**BIOS Menu 13**) can only be selected if the **Resources Controlled By** option is set to **Manual**.


Phoenix - AwardBIOS CMOS Setup Utility
IRQ Resources
IRQ-3 assigned to [Reserved]
IRQ-4 assigned to [Reserved]
IRQ-5 assigned to [Reserved]
IRQ-7 assigned to [PCI Device]
IRQ-10 assigned to [PCI Device]
IRQ-11 assigned to [PCI Device]
Item Help
Menu Level ▶
Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

BIOS Menu 13: IRQ Resources

The **IRQ Resources** menu has the following options:

- IRQ-3 assigned to
- IRQ-4 assigned to
- IRQ-5 assigned to
- IRQ-7 assigned to
- IRQ-10 assigned to
- IRQ-11 assigned to

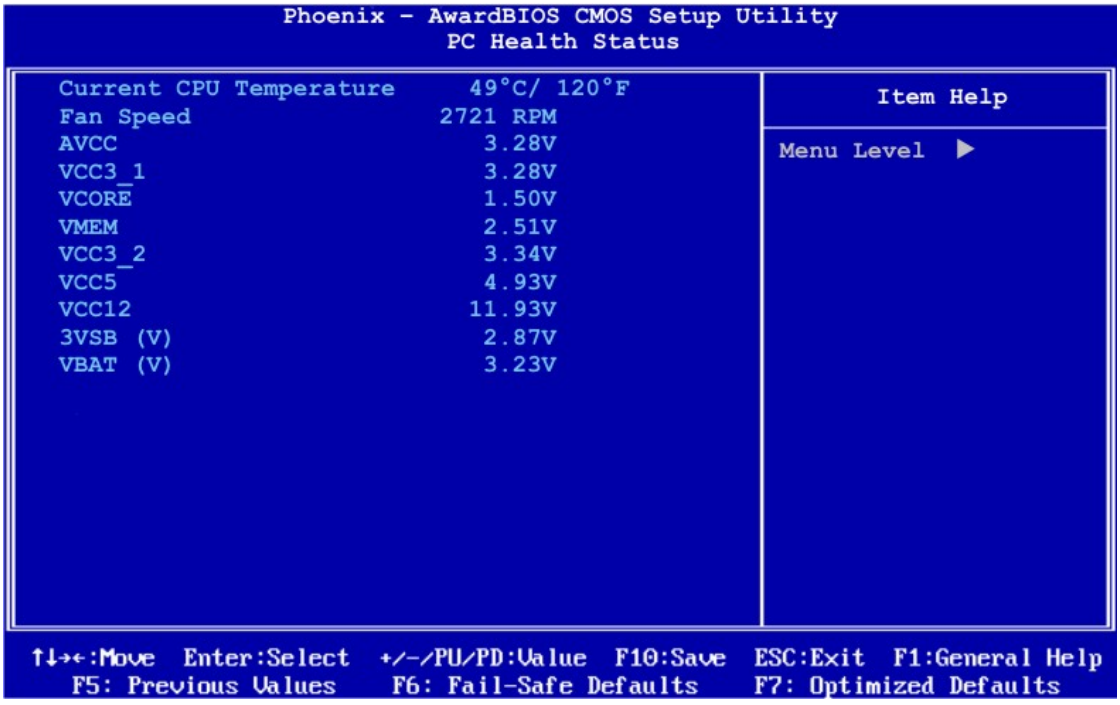
The above options all have the following default options.

➔ **PCI Device** (DEFAULT) The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

➔ **Reserved** The IRQ is reserved by BIOS.

5.8 PC Health Status

The **PC Health Status** menu (**BIOS Menu 14**) has no user configurable options, but shows system operating parameters that are essential to the stable operation of the system.



BIOS Menu 14: PC Health Status

The following system parameters are monitored by the **PC Health Status** menu.

➔ **System Temperature**

The following temperatures are monitored:

- Current CPU Temperature

➔ **Fan Speed**

The following temperatures are monitored:

- Fan Speed

➔ **Voltages**

The following voltages are monitored:

- Vcore
- Vmem
- VCC3_1
- VCC3_2
- +5V
- +12 V
- VCC
- 3VSB
- VBAT

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

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Set User Password **88**
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Exit Without Saving **88**
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Time [hh:mm:ss] **89**
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Extended Memory **90**
Total Memory **90**
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IDE Primary Master [Auto] **91**
Access Mode [Auto] **92**
Capacity **92**
Cylinder **92**
Head **93**
Precomp **93**
Landing Zone **93**
Sector **93**
SATA Boot ROM Control [Disabled] **94**
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Boot Device **95**
Boot Other Device [Enabled] **96**
Boot Up Numlock Status [On] **96**
Security Option [Setup] **96**
Full Screen Logo Show [Disabled] **97**
Video Memory Size [8M] **97**
Flat Panel Configuration [Press Enter] **98**
Onboard Audio [Enabled] **98**
Onoard USB1.0/1.1 (OHCI) [Enabled] **98**

Onboard USB2.0 (EHCI) [Enabled] 98
Flat Panel Type [CRT] 99
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Onboard Serial Port 2 [2F8/IRQ3] 103
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Parallel Port Mode [SPP] 104
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Decode Memory Space N [Disabled] 112
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Decode Memory Address N [xx] 112
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Time Alarm 115
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System Temperature 118
Fan Speed 119
Voltages 119

Appendix

B

Terminology

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

C.1 Introduction

The DIO connector on the NANO-GX is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						